

UNCLASSIFIED

US ARMY MATERIEL COMMAND



HISTORICAL SUMMARY

FISCAL YEAR 1971

HEADQUARTERS
US ARMY MATERIEL COMMAND
ALEXANDRIA, VA 22333

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Fiscal Year 1971
(RCS-CSHIS-6(R2))

Prepared by

Historical Office

Headquarters, U. S. Army Materiel Command

31 March 1974

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PREFACE

(U) This historical summary for fiscal year 1971 is the ninth installment of the Command's progress in organization, operations, and activities. This period was characterized by efforts to conserve resources while maintaining a responsive base for the Army in the face of declining funds because of the phasing down of the war in Southeast Asia. AMC activities were highlighted by logistics support to Southeast Asia in the midst of uncertainties concerning size and structure of the force, and the lack of resources and manpower.

(U) The summary is based largely on reports prepared by directorates, staff offices, and project management offices reporting directly to the Commanding General, AMC. However, it has been supplemented by interviews with Headquarters key personnel, and wherever feasible, by additional research, as indicated in footnotes. Files maintained in the Historical Office also provided important information. Classified material has been appropriately identified by paragraph and section. Remaining portions are unclassified.

(U) Based on a requirement in Army Regulation 870-5, this historical summary is useful as a means of orienting newly assigned personnel, as a general reference document, and as a source for future, more formal logistics histories. Furthermore, it furnishes background information for logistics planners and provides an avenue for answering questions of an historical nature.

(U) As in previous years, this Summary is the result of a cooperative effort. Raymond J. Snodgrass prepared Chapters I, VI, IX, XI, and completed Chapter IV; Charles W. Lynch, Chapter II; Myles G. Marken, Chapter III; Captain Howard K. Butler drafted portion of Chapter IV while on active duty in the Historical Office; Andrew A. Putignano was responsible for Chapters V, VII, VIII and X; and Dean J. Stevens wrote the Highlights Section and coordinated the finalization of the overall product. Recognition also is given to Patricia J. Parks for editing and proofreading the manuscript, and Laura A. Pennix for typing the document.

March 1974

DALE BIRDELL
Chief, Historical Office

US ARMY MATERIEL COMMAND
HISTORICAL SUMMARY
FISCAL YEAR 1971

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CHAPTER I

INTRODUCTION

(U) A brief survey of the organizational changes in the Department of Defense in the post World War II period will serve as background information for a better understanding of the reorganization of the Army in 1962 and the creation of the Army Materiel Command (AMC). During and following World War II, it became evident that the nature of warfare was undergoing radical changes. The explosion of technology had a profound impact on military organization and operations, and the development of nuclear weapons had a significant influence. The principle objective of the United States was to maintain sufficient military power to insure peace.

(U) The changes in military organization were evolutionary rather than revolutionary and each change represented a compromise between conflicting influences. During World War II, the single direction of military organizations became a prerequisite for the success of the war effort. In 1947, the National Security Act initiated a series of evolutionary changes. The Act created the National Security Council, the Central Intelligence Agency and the Office of the Secretary of Defense. The secretaries of the military departments retained all of their powers and duties, subject only to the authority of the Secretary of Defense. The Act also created the Munitions Board and the Research and Development Board. These boards were abolished in 1953.

(U) In the 1960s the Department of Defense again followed an evolutionary approach to reorganization. In 1970, the Blue Ribbon Defense

Panel recommended that the Department of Defense be divided into three major groupings--military operations, including intelligence and communications; personnel and materiel resources, and evaluation type functions, including financial controls, weapons testing, and cost analysis. The panel also recommended that the following three major unified commands be created: a strategic command; a tactical command; and a logistics command to supervise all combat forces support activities.¹ Little action was taken toward implementing the recommendations of the Blue Ribbon Defense Panel.

(U) The establishment of the AMC marked the end of five of the Army's seven technical services--the Chemical, Ordnance, Quartermaster, Signal and Transportation Corps. The Office of the Chief of Engineers and the Surgeon General's Office continued. Life-cycle materiel responsibilities were assigned to the new AMC. After 1962, the most important organizational changes were the merger of the Supply and Maintenance Command with Headquarters, AMC, and the establishment of the Tank-Automotive Command, and the Mobility Equipment Command.

(U) General Frank S. Besson, Jr., previously Chief of the Transportation Corps, headed a group which began formal planning for the AMC on 8 May 1962 and served as AMC's Commanding General from 1 August of that year until he resigned in February 1969. General Ferdinand J. Chesarek, formerly Assistant Vice Chief of Staff of the Army, assumed command in March 1969 and served until his retirement in October 1970. General

1

Report to the President and the Secretary of Defense on the Department of Defense, by the Blue Ribbon Defense Panel, 1 Jul 70.

Henry A. Miley, who was then Deputy Commanding General, AMC, became Commanding General on 1 November 1970. LTG Woodrow W. Vaughn was selected to become Deputy Commanding General on that date.

(U) In the latter part of fiscal year 1971, the General Services Administration awarded a contract to lease a new building for the AMC to be constructed on the fringe of the southeastern section of Alexandria, Virginia. Headquarters AMC was to relocate and occupy the building upon completion which was projected for October 1972. The building site was in the vicinity of Cameron Station and the Landmark Shopping Center. This structure would be eleven stories high with appropriate parking facilities,² and including a number of commercial concessions.

(U) At the end of Fiscal Year 1971, the AMC had approximately 134,000 civilian and 13,000 military personnel interspersed over 180 military installations and activities throughout the US. This marked somewhat of a sizeable decrease from the previous year when corresponding figures were 151,000 civilian and 14,000 military.

2

Memo, COL W. J. Phillips, Ch, HQ, Admin Mgt. Ofc., AMC for all personnel, HQ, AMC, 6 May 71, subj: Relocation of Headquarters, AMC.

CHAPTER II

RESOURCES

Personnel

(U) The AMC faced a host of personnel problems in Fiscal Year 1971. These included civilian manpower reductions and the promulgation of standardized reduction-in-force procedures; the decline of military personnel authorizations and assigned strength; the establishment of a Modern Volunteer Army; equal opportunity programs; military participation in the procurement field; training for improved materiel acquisition; and drastic reductions in training funds.¹ In addition, there were the many elements of the Command's Five-Year Personnel and Training Program, FY 1971-75, to be carried forward. This formal program document listed a wide variety of personnel management objectives within the four broad categories of Manpower Management, Civilian Personnel Management,² Military Personnel Management, and Training.

Force Development

(U) The force development, or manpower management program was concerned with the optimum utilization of manpower and financial resources. In Fiscal Year 1971, this entailed better usage of austere resources and improved manpower management practices. The principal vehicles for these efforts were the introduction of total AMC work measurement

¹ Maj. Gen. Robert C. Forbes, Dir, PT&FD, "The Personnel, Training and Force Development Overview," Speech in Proceedings, USAMC PT&FD Conference, 1-2 Feb 71, Arlington, VA., pp. 16-19.

² USAMC Five-Year Program, Personnel and Training Program, Fiscal Year 71-75 [c. Jul 70]

coverage; standardization of organizational structures to the maximum extent possible; and the combination of the various aspects of force development - programing, TDA, manpower management and utilization, work measurement, and organization and mission - in the Manpower Management Survey Program.

AMC Manpower Management

(U) The largest manpower problem in Fiscal Year 1971 was absorbing the loss of civilian manpower. This is shown in a comparison of yearend strengths for Fiscal Year 1970 and Fiscal Year 1971:

AMC Fiscal Year 1970 and Fiscal Year 1971 Civilian Personnel Strength Comparisons

DATE	<u>Authorized</u>	<u>Assigned</u>
	<u>1/</u>	
30 Jun 70	153,888	137,448
	<u>2/</u>	
30 Jun 71	132,439	127,730
Less Project REFLEX		
Adjustment	<u>6,111</u>	<u>-</u>
Net Losses	15,338	9,718

(U) Such reductions necessitated a continuation of the previous policy of tying planning to an under-allocation of man-years and dollars by the Department of the Army (DA). This DA allocation for Fiscal Year 1971 appeared on 31 October 1970, when the revised DA Program and Budget Guidance publication established AMC's Fiscal Year 1971 end-strength at 134,807 and Fiscal Year 1972 end-strength at 127,062. DA allocated only 127,143 man-years against these end strengths, so AMC had to plan attainment of

1/ Includes 832 summer hires and 7,065 temporary part-time employees.

2/ Includes 703 summer hires and 3,387 temporary part-time employees.

its end Fiscal Year 1972 posture soon after the beginning of Fiscal Year 1972. Meantime, in the October 1970-January 1971 period, HQ AMC and its subordinate elements began to prepare Civilian Personnel Reduction Plans (CPRP's) and Case Study and Justification Folders (CSJF's) to conform to DA's 31 October 1970 guidance. The President's subsequent "full-employment" budget alleviated AMC's problem, enabling it to prepare and receive 20 February 1971 Command approval for a revised AMC manpower program. The resulting end Fiscal Year 1971 authorization to field activities was 129,907 or 2,532 below DA's ceiling.

(U) Military strength also fell in Fiscal Year 1971. The following figures for end Fiscal Year 1970 and Fiscal Year 1971 show authorization losses:

AMC Fiscal Year 1970 and Fiscal Year 1971
Military Authorized Strength Comparisons

<u>Date</u>	<u>Officers</u>	<u>Warrent Officers</u>	<u>Enlisted Men</u>	<u>Total</u>
30 Jun 70	4,264	283	10,178	14,725
30 Jun 71	<u>4,169</u>	<u>305</u>	<u>9,632</u>	<u>14,106</u>
Net losses or gains	- 95	22	-546	-619*

(U) AMC had some compensation for its overall officer strength losses. The field grade office portion of its Projected Requisitioning Authority increased from 44.5 percent in the 3rd Quarter Fiscal Year 1970 to 50.5 percent in the 3rd Quarter Fiscal Year 1971. This percentage increase somewhat alleviated AMC's lieutenant overstrength.

*600 of these losses, consisting of 78 officers and 522 enlisted men, were attributable to an adjustment in the General Support Forces based upon a reduced level of effort in SEA.

(U) AMC's civilian personnel strength posture did not fare so well.

On 15 July 1970, based upon current strengths, manpower guidance and projected funding, AMC restricted all major subordinate commands and class II activities, less depots, to a 20 percent replacement factor -³ that is, for each loss of five civilian employees, one replacement.

The depots received a selected hiring freeze for direct and indirect⁴ overhead positions, to exclude mission personnel. The only exceptions to these restrictions were firm employment commitments made prior to the freeze; specific exceptions; and general exemptions to ammunition inspectors serving under a world-wide rotation system; intern trainee positions, position vacancies filled by granting statutory and regulatory rights, positions filled from stopper lists, security and fire-fighter positions, approved cost analysis positions, military family housing management and referral positions, commissary positions, and positions for the demonstration project on Reconciliation of Workload, Funds and Manpower (REFLEX). Later, on 12 March 1971, the depots also became subject to the same 20 percent replacement factor limitation on⁵ mission personnel.

(U) These hiring limitations proved over-restrictive. They increased the administrative workload, did not allow selective hiring, induced instability and imbalance within the workforce, and hindered the response of

3

Msg, AMCPT to AIG 865, 15 Jul 70, subj: Hiring Limitation.

4

Msg, AMCPT-SA to CO, Anniston ARDEP et al., 30 Jun 70, subj: Depot Selected Hiring Freeze.

5

Msg, AMCPT-SA to CO, USASAFLOG et al., 12 Mar 71, subj: Hiring Limitations.

commanders in meeting mission requirements. Accordingly, on 9 April and 12 April 1971, respectively, AMC amended the hiring limitation for major subordinate commands and for selected class II activities.⁶

This amended limitation allowed activities to hire not to exceed their end FY 1971-1972 authorization. A critical shortage in P720000 funds, however, established a ceiling for hires in such areas as base operations and central supply activity. This ceiling precluded the amending of hiring limitations at the depots.

(U) The net effect of the hiring limitations and freezes was that civilian strengths were reduced by attrition at many activities in order to reach approved manpower management survey levels. As a consequence, major reduction-in-force actions were not necessary except for planned consolidations or base closures.

(U) An important exception to all of these manpower policies was Project REFLEX. Initiated by AMC on 1 July 1970 according to DOD direction and DA guidance, REFLEX was a pilot project to test the concept of using fiscal controls instead of both fiscal and manpower controls to manage the operations of selected in-house RDTE laboratories.⁷ Four AMC research activities took part in REFLEX. These were: the Harry Diamond Laboratories (HDL), Washington, D.C., the Mobility Equipment Research and Development Center (MERDC) of MECOM, Fort Belvoir, VA;

6

(1) Msg, AMCPT-SA to CG, USATECOM et al., 9 Apr 71, subj: Manpower Guidance. (2) Msg, AMCPT-SA to PM AUG Element USACSA, 12 Apr 71, subj: same.

7

Ltr, AMCDL, Dep for Labs, HQ AMC, to CG, AVSCOM et al., 12 Jun 70, subj: "Demonstration Project on Reconciliation of Workload, Funds and Manpower (Project REFLEX)".

the US Army Electronics Command Laboratories, Fort Monmouth, NJ; and the Air Mobility Research and Development Complex, at the Ames Research Center, Moffett Field, CA.

(U) Project REFLEX laboratories operated under fiscal controls only and were thus neither subject to civilian manpower space authorizations nor to manpower management surveys. Civilian spaces withdrawn for the AMC portion of REFLEX totalled 6,111 including 129 temporary summer hires. AMC's manpower posture was not hurt by this management expedient, for it received funding for these positions. Actual REFLEX strength on 30 June 1971 totalled 6,005 plus 136 temporary summer hires.

(U) The purpose of REFLEX was to test how well the laboratory directors responded to increased flexibility and corresponding responsibility. REFLEX was to last three years. At the end of that time, based upon results, it could be expanded to other Army and DOD laboratories.

Organization and Mission Management

(U) In March 1971, the AMC announced four actions involving installation and activity consolidations, realignments, reductions and closures.

8
(1) Ltr, AMCDL to CG, AVSCOM et al., 22 Jun 70, subj: Demonstration Project on Reconciliation of Workload, Funds and Manpower Project REFLEX. (2) Memo, DDR&E to SA et al., 18 May 70, subj: Instructions for Implementing Project REFLEX (Demonstration Project on Reconciliation of Workload, Funds and Manpower.)

9
(1) Msg, DA to CG, USAMC et al., 9 Mar 71, subj: Installation and Activity Consolidation, Realignment, Reduction and Closure Package. (2) Msg, DA to CG, USAMC et al., 9 Mar 71, subj: Proposed Consolidation, Reduction and Realignment. (3) Msg, CG, USAMC to CG, MECOM et al., 10 Mar 71, subj: Installation & Activity Consolidation, Realignment, Reduction Closure Package. (4) Msg, CG, USAMC to CG, MECOM et al., 19 Mar 71, subj: same.

(U) There were to be two consolidations. The base operations functions of Edgewood Arsenal (MUCOM) and Aberdeen Proving Ground (TECOM) were to be merged by 1 July 1971, at a savings of 24 military and 107 civilian spaces. The Army Class Manager Activities (ACMA's) were also to be consolidated by 31 July 1971. ACMA personnel from the US Army Support Center, Richmond, VA; the Industrial Supply ACMA, Frankford Arsenal, Philadelphia, PA; the Mobility Equipment Command, St. Louis, MO; and the Directorate for Materiel Management, ECOM, Philadelphia, PA, were transferred to the New Cumberland Army Depot, New Cumberland, PA. Associated with this consolidation, the Industrial Supply ACMA at Frankford Arsenal discontinued operations and the Subsistence ACMA of the US Army Support Center, Philadelphia, PA, transferred to the US Army Support Center, Philadelphia, PA. This consolidation and the reorganization saved two military and 100 civilian spaces.

(U) There were two closures. The US Army General Equipment Test Activity, a TECOM element located at Fort Lee, VA, was to be disestablished by 31 December 1971, saving 127 military and 57 civilian spaces. The Fort Wingate Army Depot, Gallup, NM, was placed in a reserve status one year early, on 30 June 1971. This saved 7 military and 127 civilian spaces.

(U) One other closure was the inactivation of the Granite City Army Depot on 30 June 1971. This depot had provided certain DOD area support actions, such as commissary and family housing services, to the St. Louis, MO, area. The AMC sought to have responsibility for them transferred to CONARC, but DA ruled AMC still responsible. This responsibility was therefore assigned to AVSCOM, effective 1 July 1971.

AVSCOM gained 8 military and 228 civilian spaces with this assignment.

Standard Commodity Command Realignment

(U) In order to standardize its command-wide operations, AMC, on 28 January 1970, prescribed a standard organizational structure for the headquarters of its seven commodity commands - AVSCOM, ECOM, MECOM, MICOM, MUCOM, TACOM and WECOM. To be effective 25 June 1971, this structure was known as the Standard Commodity Command (SCC) structure. AMC received DA approval to finalize the reorganizations before the end of the fiscal year, and AMC responded with a series of general orders in the 23 April - 3 May 1971 period.

Other Force Development Actions

(U) One important type of force development action was the manpower survey. During Fiscal Year 71 the Manpower Survey Branch conducted 41 such surveys concerning 30,533 spaces. The results of the surveys were:

	<u>Increases Recommended</u>	<u>Decreases Recommended</u>	<u>Net Recommended</u>
Military	51	53	2
Civilian	<u>242</u> 293	<u>1096</u> -1149	<u>-854</u> -856

(U) The branch also monitored four manpower surveys at major subordinate commands and reviewed 35 reports of manpower utilization surveys

10

(1) Ltr, AMCPT-SA to DCSLOG DA, 17 Aug 70, subj: Responsibility for St. Louis Area Support Mission Subsequent to Inactivation of Granite City Army Depot. (2) Msg, DA to CG, CONARC et al., 18 Jan 71, subj: Responsibility for St. Louis Area Support Mission. (3) Msg, AMCPT-SA to CG, AVSCOM and CO GRANITE ARDEP, 08 Mar 71, subj: Responsibility for St. Louis Area Support Mission and GCAD Site Operations.

conducted by those commands.

(U) Another significant routine action was the AMC Work Measurement Program. On 3 September 1970, the DCG, AMC approved the implementation of an AMC Work Measurement Plan of Action which established a work measurement steering committee, chaired by himself, a Work Measurement Board at HQ, AMC; a work measurement implementation committee at each of the major subordinate commands and depots; and a time-phased milestone plan applicable to HQ, AMC and the field.¹¹

(U) The first meeting of the HQ Board took place on 11 September 1970, constituting Headquarters Milestone II. By 2 October 1970 all significant plans and directives went to the field by letter, constituting Headquarters Milestone III.¹²

(U) Work measurement progress evolved during the fiscal year. Its initial focus lay under those four functional areas which supposedly offered the greatest potential for work measurement returns. These were: the Defense Integrated Management Systems (DIMES) Performance Measurement System for Supply Depot Operations; the DIMES Performance Measurement System for Supply Management Operations; and the Performance Measurement Systems for Depot Maintenance and for Base Operations.¹³

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(1) Ltr, AMCPT-S to CG, AVSCOM et al., 3 Sep 70, subj: AMC Work Measurement Program Plan of Action. (2) AMC Memo 15-30, 30 Sep 70, subj: AMC Work Measurement Program Steering Committee. (3) AMC Memo 15-29, 11 Sep 70, subj: AMC Work Measurement Board.

12

Ltr, AMCPT-S to CG, AVSCOM et al., 7 Oct 70, subj: AMC Work Measurement Plan of Actions.

13

Ltr, AMCPT-SU to CG, AVSCOM et al., 20 Mar 70, subj: AMC Work Measurement Program.

(U) During Fiscal Year 1971, however, emphasis broadened from these four areas to attempt total work measurement coverage for all depots. The command met this goal, and set a similar goal for all other functional areas at the major subordinate commands and separate installations and activities for the end of Fiscal Year 1972.

2. Civilian Personnel Management

(U) The biggest story in civilian personnel management in Fiscal Year 71 was reduction, retirements, retrenchments, realignments, functional transfers and reorganizations, base closures and proposed reductions were constant subjects of interest. Total civilian strength in full-time permanent - positions declined from 138,347 to 129,363, a loss of 8,984. Because of many retirements, however, only 1,717 employees were actually separated through reduction-in-force procedures.

(U) Secondary items of interest were the Equal Employment Opportunity (EEO) Program, the employment of women, the domestic action program to make underprivileged youths employable, career management, and the awards program.

(U) The EEO program had the most significant impact of all of the secondary programs. This was due to two factors: one, the on-going reductions; and, two, the attempt to control grade escalation. The EEO had several goals: doubling the number of minority personnel in career program positions; increasing the number of minority personnel and women in grades GS-11 and above to not less than 10 or 15 percent of such grades; and placement of minority employees in three to five percent of the supergrade positions. All of these goals ran directly against overall grade and employee reductions, making personnel

management tasks far more difficult. The command nevertheless drew up an AMC Command EEO Action Plan, issued 11 August 1970. DA gave it verbal approval late in the year, and DA also called in for review all of those EEO Action Plans of all AMC subordinate activities having 5,000 or more employees.

(U) Second to EEO in importance was the career management program. Two areas were of special interest in this program. One was the career interns area; the other the Engineer and Scientist (Non-Construction) Career Management Program.

(U) The career intern recruitment program suffered in Fiscal Year 1971. This was due to the reassessment of intern positions. The result of this reassessment reduced the number of interns from 1,730 to 1,528, reduced the number of management interns from 1,381 to 1,030, and rearranged some AMC training sites and career fields. Engineer and Scientist interns, however, rose from 349 to 480. As of 30 June 1971, 1,212 career interns were on board, or 79.3 percent of the revised fiscal year goal.

(U) AMC made a determined effort in the last half of Fiscal Year 1971 to increase the effectiveness of the Engineer and Scientist (Non-Construction) Career Management Program. Fifteen occupational study groups, composed of professional employees chosen from all major DA users of these skills, met to conduct an in-depth analysis of the various occupations in this program. The groups had two objectives: one, to revise and update experience codes to reflect technological advances; and, two, to recommend improvements in the career referral system and to determine the appropriate mandatory referral level for

each occupation in the career field. The Engineer and Scientist career planning board also expanded to provide broader DA representation, and AMC established a full-time career program specialist to provide direct support to the Deputy for Laboratories.

Military Personnel Management

(U) Military personnel management had much the same problems as had civilian personnel management, although its reductions were on a far smaller scale. The Director of Personnel believed that these reductions could be offset, and efficiency increased, by attracting superior military personnel through three means: Officer special career programs; the NCO Logistics Program (NCO LP); and the establishment of graduate level military position requirements.¹⁴ AMC also extended certain elements of the Program for the Refinement of the Materiel Acquisition Process (PROMAP)-70 Program, especially that segment called the "Enhancement of Procurement Careers."

(U) The enhancement of officer special career programs in Fiscal Year 1971 closely followed the standardization of the staffing structure of major subordinate commands and the creation of a pyramid of junior officer development slots under key positions. In cognizance of these events, AMC updated officer special career program positions for the following positions:

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Presentation, MG Robert C. Forbes, Dir/PT&FD to AMC Cmdrs Conf., Cameron Station, Alexandria, VA., 11 Mar 70, subj: AMC Personnel Challenges and Responses, FY 71.

<u>Program</u>	<u>Number of Key Positions</u>	<u>Number of Supporting Positions</u>	<u>Total</u>	<u>Change</u>
Automatic Data Processing	7	24	31	0
Atomic Energy	7	33	40	433
Comptroller	10	26	36	-15
Information	1	5	6	4 3
Logistics	126	160	286	458
Procurement	29	183	212	469
Research & Development	<u>113</u>	<u>400</u>	<u>513</u>	<u>4157</u>
Total	293	831	1,124	4305

(U) The total of such special officer positions represented 28.7 percent of the 4th Quarter projected requisition authority (PRA) of 3,912 officers allotted to AMC.

(U) The NCOLP formalized Army support for the development of the logistics skills of NCO's and for the assignment of trained NCO's to key logistics positions. In Fiscal Year 1971 AMC had 280 "Key NCOLP" designated positions for training. As of April 1971, 203 of these positions were manned.

(U) The graduate level military position requirements program at AMC meant an increase in the number of those AMC officer positions identified as requiring graduate level education. The Army Educational Requirements Board (AERB) approved positions for such requirements. In Fiscal Year 1971, the board increased these positions from 654 to 812. AMC also had 496 requests for new positions ready for the next AERB meeting in October 1971.

(U) Besides its own efforts, AMC's officer management program responded to DA programs. These programs included the Modern Volunteer Army, Equal Opportunity, Project TRANSITION to teach useful civilian skills to separating servicemen, the Army Community Service Program, the Mobilization Designation (MOBDES) Program, and a new Officer Personnel Management System (OPMS). The new OPMS had the most immediate potential influence on officer management. On 19 April 1971 DCSPER requested DCSLOG to assist in the development of a plan for such a new system. DCSLOG in turn requested AMC, OCRD, CDC and appropriate service schools to join in drafting a joint response. By June 1971, the DCG, AMC had approved a tentative AMC position. The Command's recommendations included: one, a new MOS system; two, a concept for the career development of Materiel Officers; three, the formation of a Materiel Corps which would be included with the Transportation Corps Branch in the Logistics group; and, four, the division of the Logistics and Movements Group into two branches, each under DCSLOG sponsorship. DA sent out the official OPMS proposal for world-wide comment on 25 June 15 1971.

(U) Fiscal Year 1971 was one of the most extensive training years in AMC history. The three AMC schools, four Industrial Training Programs, and the USAMC Ammunition School trained 29,130 personnel. The impetus for this output was the full implementation of PROMAP-70 training objectives.

15

Ltr, AGDA-A(M) to CG USAREUR et al., 25 Jun 71, subj: The Officer Personnel Management System (OPMS).

(U) The AMC School System underwent a key development in Fiscal Year 1971. This development involved the provision of a member to a management training study group that was under the direction of the Comptroller of the Army (COA). Meeting from August through December 1970, this group studied the feasibility of consolidating the Army Management Schools (AMS), the Army Management Engineering Training Agency (AMETA), and the Army Logistics Management Center (ALMC). The group recommended the consolidation of AMS and AMETA with ALMC at Fort Lee, VA. VCSA approved the consolidation in January 1971, and AMS joined ALMC on 30 April 1971. The AMETA phase, however, was delayed pending further study.

(U) In another school system development, AMETA on 10 June 1970 proposed to expand its mission and change its name to the Management Information Technology Agency. AMETA's new role would make it the centralized field agency for management of research and consulting services for command, Army and DOD priority needs. AMC did not approve the proposal on the grounds that the change gave preference to research and consulting versus education and training, and it also impinged upon the research and consulting missions of other AMC elements.

(U) To supplement the work of the schools, AMC set training objectives. These included an ALMC study to improve the process of determining training requirements, developed an extensive training program to support PROMAP-70, proposed a baccalaureate logistics

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Ltr, AMCPT-TL to Dir, AMETA, 25 May 71, subj: Proposed Role and Mission of US Army Management Engineering Training Agency (USAMETA).

degree program, proposed an expansion of the Logistics Executive Development Course, and tasked ALMC to establish a procedure for the commodity command review of CONARC programs of instruction (POI) impacting on the maintenance of that equipment developed by AMC. AMC also proposed a Master's Degree Program in Logistics. The command had proposed this program earlier, but DCSPER had returned it as an invalidated need. AMC resubmitted it on 1 December 1970 to DCSLOG, complete
17
with a new curriculum.

Personnel and Organizational Management of HQ, AMC

(U) The directorate continued to provide military and civilian personnel management, manpower management, and training services to some 2,500 odd personnel at HQ, AMC and its serviced activities. The directorate had two chief concerns in this operation in Fiscal Year 1971. One was the personnel reduction, the other a complete organizational review and analysis. This organizational review and analysis meant an overall TDA reduction of 272 authorized spaces, from 2,803 to
18
2,531 spaces. The military authorization fell from 304 to 282 and the civilian authorization from 2,499 to 2,249.

(U) HQ, AMC attempted to meet this reduction in three ways: strengthening the staff role of headquarters; consolidating similar functions; and minimizing the expenditure of

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Ltr, AMCPT-TL to DCSLOG-LOG-LPTD, 1 Dec 70, subj: Master of Science in Logistics Program.

18

Ltr, AGAO-D to CG, AMC, 10 Jun 71, subj: Approval of TDA (M1 No. 123, FY 71).

manpower resources. The results were to be headquarters elements that would primarily give guidance to counterpart field organizations. Examples of this organization included the establishment of an Aviation Office, an Environmental Control Office and an Inventory and Location Survey Office; major reorganizations of the Comptroller and the Management Information Systems Directorate, the P,T&FD, the Research, Development and Engineering Directorate, and the Requirements and Procurement Directorate; and the deletion of the Integrated Weapons Support Management Office. Despite all of these reorganizations, however, the command average grade rose to 10.81.

Organization and Staffing of the Directorate

(U) To meet all of the new organizational needs arising from the personnel reduction, and to cope with new command objectives, the directorate reorganized. On 1 July 1970, the directorate dropped its previous designation as the Directorate of Personnel and Training and became known as the Directorate of Personnel, Training and Force Development.¹⁹ The Manpower Division of the directorate also became redesignated at the same time, to be known as the Force Development Division. Both of these redesignations were in line with a DA-approved AMC concept plan for improvement in the management of the Army Authorization Documents System.

(U) Besides the redesignations, the directorate underwent several structural changes. The Training Division, the Force Development

19

(1) HQ AMC Staff Directory, 1 Apr 70. (2) Memo, AMCPT-S to CG, AMC, 8 Jul 70, subj: Redesignation of Directorate for Personnel, Training and Force Development.

Division and the Military Personnel Division all reorganized. The Plans and Programs Office disappeared, and AMC established an Office of Special Assistant for Modern Volunteer Army in January 1971.

(U) The directorate lost three military and 12 civilian authorized spaces in its restructuring,²⁰ and it gained one enlisted space.²¹

This change follows by organizational element:

<u>Element</u>	<u>Change</u>		<u>New Authorization</u>			
	<u>Mil</u>	<u>Civ</u>	<u>Civ</u>	<u>Off</u>	<u>WO</u>	<u>EM</u>
Director's Ofc	0	0				
Spec Asst, MVA	+1	+1	3	2		
Plans & Admin Ofc	0	-1	6			
Civ Pers Div	0	-8	84			
Force Dev Div	3	+3	54	4		
Trng Div	0	-4	14	4		
Mil Pers Div	<u>0</u> -2	<u>-3</u> -12	<u>32</u> 194	<u>12</u> 23	<u>—</u> 0	<u>7</u> 7

(U) The directorate fared well in the Fiscal Year 1971 reduction-in-force situation. Only seven employees received notices; four of the notices were transfers-in-grade to other positions and three were reassignments to lower grade positions. Eight other employees were to be reassigned to the directorate from other elements, six being lateral transfers and two at lower grade.

20

MTDA, HQ AMC, 30 Jun 71.

21

Ch 7, MAV FY 71-31-1, 27 Apr 71.

Funding Levels

Military Assistance Program (MAP) Appropriation

(U) The level of MAP funding increased from \$15,280,885 on 1 July 1970 to \$17,808,945 by the end of the fiscal year. Although MAP Grant Aid program received increases in funds during the year, these funds were never sufficient to accomplish the program objectives for the year. Consequently, Operation and Maintenance, Army (OMA) appropriations paid for some of the work performed for MAP Grant Aid -
22
a situation which has existed year after year.

Procurement of Equipment and Missiles, Army (PEMA) Appropriation

(U) The PEMA program released by the Department of the Army to HQ AMC in Fiscal Year 1971 amounted to \$4,890.1 million, down \$336.3 million from the original planned Fiscal Year 1971 program. This was comprised of \$2,710.8 million of Direct Army, \$789.6 million for Customer Orders received, and \$1,389.7 million of prior year carryover. Against the total program received, contracts totalling \$4,328.1 were awarded. Included in the Direct Army program was approximately \$410 million for Production Base Support.

Research, Development, Test and Evaluation, Army (RDTE) Appropriation

(U) The AMC's RDTE program, initially financed in the amount of \$1,060 million at the beginning of this fiscal year, was adjusted by DA throughout the year and ended as a \$1,216 million program for Fiscal Year 1971.

Financial Management

Project REFLEX

(U) Project REFLEX, an OSD directed demonstration on Reconciliation of Workload, Funds and Manpower, was implemented at the beginning of Fiscal Year 1971 at selected AMC Laboratories (Harry Diamond Laboratories, Mobility Equipment R&D Center, Air Mobility R&D Complex, and laboratories of the Electronics Command). The purpose was to test the concept of using fiscal controls alone in the management and operation of AMC laboratories, rather than a combination of fiscal and manpower controls.

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Resources Management

(U) Established in May 1969, the AMC Resource Management Report (RCS-AMCCP-159) completed its second full year and proved its worth by giving budget visibility to top managers. This report is in effect a budget execution review which reflects data that is used to justify and defend fund requirements. Some modifications in the report, including a change to quarterly rather than monthly schedules, were being considered.

24

Review and Command Assessment of Projects (RECAP)

(U) In April 1971, a quarterly review of Project Managed programs was initiated under a newly established procedure entitled RECAP. It provides for briefings on selected major weapon systems to be given to the Commander and the Command Group by Project Managers.

25

23

Ibid., p. 4

24

Ibid., p. 5

25

Ibid., pp. 10, 42.

Military Standard Contract Administration Procedures (MILSCAP)

(U) During April 1971, Assistant Secretary of Defense (I&L) B. J. Shillito concurred in an implementation date of 1 July 1972 for MILSCAP. The Air Force, supported by the Navy, recommended that the entire MILSCAP program be cancelled, but on 30 June 1971 Mr. Shillito decided that MILSCAP should be implemented as scheduled, with some relief given to certain organizational elements in the form of authorization to implement MILSCAP initially on a limited basis only.²⁶

New and Prior Year Appropriations

(U) The DOD Appropriation Act for Fiscal Year 1971 provided that there be a clear cutoff between Fiscal Year 1971 and prior year appropriations and the new Fiscal Year 1972 appropriations for the Procurement of Equipment and Missiles, Army (PEMA) and Research, Development, Test, and Evaluation (RDTE) funded programs. Each prior year appropriation was to be merged with the corresponding Fiscal Year 1971 appropriation and a time limit was set during which these appropriations would be available for obligation: the end of Fiscal Year 1972 for RDT&E funds and the end of Fiscal Year 1973 for PEMA. Further OSD guidance specified that there would be no programing between (a) Fiscal Year 1971 and prior programs and (b) Fiscal Year 1972 and later programs, irrespective of the source of funds.²⁷

²⁶

Ibid., p. 18

²⁷

Ibid., p. 21

Consolidation of Army Class Manager Activities

(U) The relocation and consolidation of certain Army Class Manager Activities (ACMAs) was directed, effective 31 July 1971.²⁸ Ground forces Support (formerly at MECOM), Industrial Supplies (formerly at Frankford Arsenal), and General Supplies (formerly at Richmond) were relocated at New Cumberland Army Depot as the US Army General Materiel and Parts Center (USAGMPC), a separate Class II activity. In addition, the Subsistence Office (formerly in Chicago) was merged with Clothing and Textiles at Philadelphia.²⁹

AMC Program Objectives

(U) In Fiscal Year 1971, a new system evolved within AMC for developing objectives based on established AMC goals. This system replaced the Command Objectives system used in prior years. Under the new system, the designation is Major Program Objectives. The Fiscal Year 1972-1976 Program Objectives were developed by the AMC Program Directors as implementation of the eight major AMC goals approved by the AMC Select Committee for this 5-year period.³⁰

Military Construction Program

(U) DA dollar guidance for AMC's Fiscal Year 1972 Military Construction, Army (MCA) Program was set at \$118 million and a recommended program in that amount consisting of 93 projects was submitted. This figure was finally pared to \$79 million in DA's recommended program to

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AMC GO 90, 3 May 1971

²⁹

Comptroller, AMC, Annual Historical Summary, FY 1971, p. 26

³⁰

Ibid., pp. 57, 66

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OSD, and a further reduction to \$78 million for 63 projects was made prior to the DOD submission to the Congress. Congressional review and approval of this program was still pending as of the end of Fiscal Year 1971.

(U) A total of 169 projects valued at \$238 million was submitted by AMC installations for consideration in the Fiscal Year 1973 MCA Program. As dollar guidance from DA amounted to \$75 million, a selective rather than a balanced program was developed. A list of 58 projects which were deemed most essential to AMC and which were within the guidance provided by DA was submitted to the Department of the Army
31
in January 1971.

Installations & Services

(FOUO) The number of AMC Class II activities decreased from 105 to 102 during Fiscal Year 1971; the number of Class II installations remained at 83. The overall acreage reported by the AMC during the fiscal year was reduced from 4,825,092 to 4,783,337. The total evaluation of AMC real property decreased from \$3,709,580,000 to \$3,555,000,000. Building space decreased from 272,806,937 to 237,471,502 square feet.

Military Construction

(FOUO) During Fiscal Year 1971 a new approach to development of the Military Construction, Army (MCA) program was instituted, thereby controlling both dollar limitation and essential functional facilities

31

Ibid., p. 58

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without resorting to a multi-million dollar shopping list with its inherent workload requiring detailed review and final selection of projects.

(FOUO) A retrenchment in the management of real property which began in Fiscal Year 1970 was continued in Fiscal Year 1971. A reduction in civilian spaces by the end of June 1971 at selected installations necessitated curtailment of non-mission maintenance, such as grounds maintenance, painting, and custodial work. Fire departments were reduced in strength, or eliminated wherever the function could be assumed by municipal fire departments.

FY 1971 MCA Program

(FOUO) The AMC's original MCA program for Fiscal Year 1971 as submitted to the Department of the Army (DA) contained 76 projects³² estimated to cost \$148.2 million. A subsequent submission, necessitated by Fiscal Year 1969 Congressional denials and Fiscal Year 1970 DOD deferrals, increased the program to 109 projects with an estimated cost of \$168.1 million.³³ Following DA and DOD reviews, a program of 40 projects with an estimated cost of \$44.2 million was submitted to the Congress. Congress authorized 32 new projects totalling \$44,427,000³⁴ and five deficiency projects totalling \$1,371,000.

³²
Ltr, AMCIS-CD, Chief of Staff, AMC to OCE, 22 Jan 69, subj: FY 1971-1975 MCA Program.

³³
Ltr, same to same, 18 Apr 69, subj: same.

³⁴
P/L 91-511 and 91-544.

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FY 1972 MCA Program

(FOUO) To decrease the time required to provide permanent facilities at Army installations, the funding guidance for Fiscal Year 1972 was increased for all Army commands. The guidance for AMC was set at \$115 million, plus selected air and water pollution abatement projects. Executive Order 11507 on prevention, control and abatement of air and water pollution at Federal facilities prompted another 79 projects with an estimated cost of \$79.5 million. The total submission to DA comprised 168 projects carrying an estimated price tag of \$208.5 million. DA and DOD reviews resulted in 62 new projects and two deficiency projects totalling \$78 million being submitted to the Congress.

FY 1973 MCA Program

(FOUO) Funding guidance for Fiscal Year 1973 was reduced to \$75 million. In continuation of its policy of not submitting programs that exceed funding guidance, the AMC submitted 58 projects with an estimated cost of \$73,970,000.

35

(1) Ltr, AGDA (M) (22 Oct 69) LOG-C-PDBB, 30 Oct 69, subj: FY 1972 MCA Supplementary Program Guidance (2) Ltr, AMCIS-CD, 15 Jan 70, subj: FY 1972 Military Construction, Army (MCA) Program.

36

Ltr, AMCIS-CD, 5 May 70, subj: FY 1972 Military Construction, Army Program.

37

Directorate of Installations and Services, AMC Annual Historical Summary, FY 1971, pp. 8, 9.

38

(1) Ltr, ACDA (M) (21 Jul 70) LOG-C-PDBB, DA, 23 Jul 70, subj: FY 1973 Military Construction, Army (MCA) Program Guidance; (2) Ltr, AMCID-MD, Chief of Staff, AMC, to OCE, 13 Jan 71, subj: FY 1973-1977 Military Construction, Army Program.

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Air and Water Pollution Abatement Program

(FOUO) The MCA Air and Pollution Abatement Program continued to grow as the AMC projected a total program of 140 projects at a cost of \$119.5 million. Ten such projects were authorized and funded in 1968-69, 15 in Fiscal Year 1970, and 17 in Fiscal Year 1971. Funding rose from nearly \$5.3 million in Fiscal Year 1968-69 for these MCA projects to almost \$11 million in Fiscal Year 1971. For Fiscal Year 1972 a program of 60 projects, priced at \$54.8 million, was submitted to the Congress, and for Fiscal Year 1973 the AMC proposed 32 projects costing nearly \$32 million.

Real Estate

(FOUO) Many of the real estate actions in Fiscal Year 1971 were the result of the issuance of Executive Order 11508, which required a continuing review of all Federal property to insure the prompt release of real property no longer needed. To date, Executive Order 11508 has evolved into a three-phased study: a determination of the least utilized 10 percent of installations properties; a report of land near urban areas suitable for recreation; and a requirement to defend retention of selected areas reported as least utilized. As a result of the survey, reports of excess totalling 1,313 acres were submitted on portions of Aberdeen Proving Ground, Pine Bluff Arsenal, Lima Modification Center, and the Lexington-Blue Grass, Tobyhanna, and Umatilla Army Depots.

39

Directorate of Installations and Services, AMC, Annual Historical Summary, FY 1971, p. 23.

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(FOUO) A number of other actions involving AMC real estate are worth noting. Congressional approval was received for the transfer of the Hays Ammunition Plant at Pittsburgh from the Department of the Navy to the Department of the Army. Land and facilities at Pine Bluff Arsenal, Arkansas, and Fort Detrick, Maryland, became available for use by other government agencies as a result of the presidential decision to discontinue experiments and production of biological warfare agents. The Army Pictorial Center, in New York City, was placed on an inactive status on 30 June 1970, and both the city and the US Postal Service indicated an interest in the property. As a result of the demilitarization at Rocky Mountain Arsenal, Denver, Colorado, two conveyances of land totalling 75 acres were negotiated, including a 65 acre site to the US Postal Service for future use as a national bulk mail distribution center. Granite City Army Depot, Granite City, Illinois, became an inactive installation on 30 June 1971.

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Communications Programs

Automatic Digital Network (AUTODIN)

(U) AUTODIN is a worldwide common user communications network, a major element of the Defense Communications System and the principle system for record transmissions. At the beginning of Fiscal Year 1971, there were 50 AUTODIN data terminals and three AUTODIN teletypewriter terminals operating in the command. During the year the three teletypewriter terminals were phased out and their function combined with the data terminals. The number of government-owned terminals increased from 12 to 23 during the year, and the number of leased terminals

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Material for this section is from Directorate of Installations and Services, AMC, Annual Historical Summary, FY 1971, pp. 44-56.

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decline to 27. New terminals installed in newly activated telecommunications centers balanced the deactivations at Navajo and Granite City Army Depots, Chicago Procurement Agency, and the US Army Materiel-Mechanics Research Center, and the AMC ended Fiscal Year 1971 with 50 AUTODIN terminals. Plans for Fiscal Year 1972 called for installation of 12 more government-owned terminals at new telecommunications centers and the upgrading of ten leased terminals by use of more versatile and less costly equipment.

Automated Telecommunications Center (ATCC)

(U) The approval, by the Assistant Secretary of Defense for Installations and Services in July 1965, of the Telecommunications Program Objective (TPO) for a Local Digital Message Exchange (LDMX) at Redstone Arsenal, but as an AUTODIN switch, launched a pioneering effort to⁴¹ interface an LDMX into the Defense Communications System Automatic Digital Network. Representatives of the AMC and various Army and Defense agencies set about defining the requirements, writing the specifications, and determining responsibilities regarding the procurement, installation, and operation of LDMX's in the AMC. By the end of this fiscal year, the AMC-wide program stood at 25 proposed LDMX installations, and the writing of the specifications for a competitive procurement of the first one, at Redstone Arsenal, was underway.

Audio-Visual Management

(U) When the Army Pictorial Center, a motion picture production facility, was closed on 30 June 1970, the film library functions, which

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During FY 1970, the title LDMX was replaced by Automated Telecommunications Center (ATCC).

represented a continuing Department of the Army requirement, were retained within the AMC. These functions were transferred to Tobyhanna Army Depot, effective 1 July 1970, under the Audio-Visual Division of the Directorate for Distribution and Transportation.

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Management Information Systems

(U) With the Command operating over \$190 million worth of automatic data processing equipment (ADPE) at 98 separate AMC installations, involving some 8100 ADP personnel, the utilization and scheduling of these assets and their supporting facilities, equipment and supplies had become of increasing importance. It required among other things, controlling changes to standard systems, identifying areas of redundancy or interdependency within existing systems, and controlling requirements for reporting.

Reports Management

(U) One of the goals of PROMAP-70 (Program for Refinement of the Materiel Acquisition Process) was the elimination of non-essential reporting. A review of materiel acquisition reports completed on 31 August 1970, resulted in the elimination of 34 of 172 reports, for an annual savings of \$179,800. In addition, the major subordinate commands reported savings of \$285,400 by eliminating internal reports and internal ADP products, for a total savings of \$465,200 under this project.

(U) In the area of logistical support, a review of 295 logistics reports completed on 31 April 1971 resulted in the cancellation of 39 reports for an actual annual savings of \$979,599. The effort to eliminate non-essential reporting was extended on 30 June 1971 to

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Material for this section is from Directorate of Management Information Systems, AMC, Annual Historical Summary, FY 1971.

137 reports in the Comptroller functional area. This review, targeted for completion by 30 October 1971, is expected to accomplish a 20 percent reduction in the number of reports in this functional area.

New and Improved Systems

(U) The TEAM-UP (Test, Evaluation, Analysis and Management Uniformity Plan) system was conceived to provide standardized data necessary to the management of TECOM installations. Part A, consisting of eight management systems most critical to TECOM management were extended to TECOM installations during the spring of 1971, and as of 30 June 1971 were operational. Part C encompassed scientific and engineering requirements and support for range operations at White Sands Missile Range. During Fiscal Year 1971 all of the computer hardware for Part C, except for one batch processor used for classified data, was installed, and all reviews disclosed that conversions to the new equipment were proceeding satisfactorily. The Data Automation requirement for TEAM-UP Part D was approved by Department of the Army during 1971 and preparations were made for the complete installation of Part D terminals and the conversion of programs to be completed by the end of December 1971.

(U) The application of the SPEEDEX (system-wide project for electronic equipment at depots extended), using the CDC 3300 computer system, got underway at Letterkenny Army Depot in July 1970. On 7-8 December 1970 a DA follow-on evaluation of the SPEEDEX system was conducted and approval was given for SPEEDEX to be extended as the standard AMC depot system. By June 1971 SPEEDEX CDC 3300 equipment had also been installed at Tobyhanna Army Depot, DA approval for

SPEEDEX equipment at New Cumberland Army Depot had been received, and the number of applications at the prototype installation, Letterkenny had grown to six: three hardcore and three follow-on. In addition, the multiple depot concept was readied for testing, beginning in July 1971. Using remote terminals at Sierra Army Depot, receipt, storage, issue, and transportation data generated at Sierra will be fed through communications lines to the computer at Letterkenny.

Project Manager's Information System (PROMIS)

(U) During Fiscal Year 1971, the Army Management Engineering Training Agency (AMETA) pursued the development of a Project Manager's information system known as PROMIS, Phase II. The year ended with a need for greater clarification and more specific information regarding proposed contractual efforts required in the development of this system.

(U) The AMETA developed a risk analysis technique for Project Managers to use in assessing probability of success associated with different approaches to the design and development of materiel systems. Also, the AMETA developed an assessment technique that provided Project Managers with a capability of tracking progress against the plan. The risk analysis tool was implemented on three projects during the last half of this fiscal year; the assessment technique was applied to one.

(U) Other management systems were in various states of development in Fiscal Year 1971. Technical Data Center's project for storage and retrieval of immense quantities of drawings, specifications, and documents necessary for the management of Army Materiel throughout its life cycle was readied for implementation early in Fiscal Year 1972.

Work on the marriage of Military Standard Contract Administrative Procedures (MILSCAP) to ALPHA (AMC Logistics Program, Hard Core Automated) went forward, and the Planning, Programming and Budgeting Management Information System (PPBMIS), the Commodity Command Management Information System (CCMIS), and the Depot Management Information System (DEPMIS), were all under development.

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Plans and Analysis

Environmental Control

(U) To coordinate efforts within AMC to control pollution and comply with federal, state, and local laws pertaining to the control of pollution in the environment, the mission of the Plans and Analysis Directorate was expanded on 2 June 1970 to include Pollution Control. An Environmental Control Office staffed by six professionals and one secretary was established to accomplish this new mission. An AMC Pollution Abatement Plan was subsequently developed and submitted on 31 March 1971 to the Department of the Army. The plan considers alternative courses of action, cost/time/effectiveness trade-offs, impact on security, and compliance with applicable standards and it is expected to chart AMC's course with regard to this important national program.

AMC Study System

(U) A new version of AMCR 5-1, the USAMC Study System, was published 24 June 1971. Among other things, the revised regulation increased the visibility and control of in-house and contract studies,

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Material for this section is from Plans and Analysis Directorate, AMC, Annual Historical Summary, FY 1971.

as well as the evaluation/use of completed studies. In the area of contract studies, AMC organizational elements submitted a total of 37 contract study proposals in Fiscal Year 1971, representing an estimated cost of \$11.4 million. Of these, 13 at estimated cost of \$2.7 million were approved.

CHAPTER III
PROJECT MANAGEMENT
PART I-WEAPONS

Introduction

(U) Reporting to the Deputy Commanding General for Materiel Acquisition, the Special Assistant for Project Management is the focal point within Headquarters, AMC for project management concepts and guidance for the various project managers. This applies to those managers reporting to commodity commanders as well as to those reporting directly to AMC Headquarters. Project management is a concept for the management of high cost, highly important and complex weapons systems and equipment systems meeting specified Office, Secretary of Defense and Department of the Army criteria. There are both Project and Product Managers with Project Managers being chartered by the Secretary of the Army and Product Managers being chartered by the Commanding General, AMC. Each type of manager is responsible for directing and controlling all phases of research, development and initial procurement, production, and logistic support to meet the objectives stated in his charter. At the beginning of FY 1971 (8 July 1971), there were 33 Project Managers and 5 Product Managers.

(U) Throughout Fiscal Year 1970, the Army Materiel Command had conducted a comprehensive review of the status of project managership within the Army. AMC took into account the numerous Army Audit Agency findings over the preceding five years and the results of a

number of special studies on the subject. Congressional criticism of the materiel acquisition performance by the military services also concerned AMC managers.¹

(U) Faced with increasingly complex systems requiring longer development time and including sharply increasing costs, the Department of Defense continuously sought better ways of acquiring weapons and equipment systems more quickly and more economically. The Army staff was working on an updated set of criteria that would attempt a realistic system of system acquisition that would strive to shorten development time to about six years, assure funding priorities, control costs, assure quality, control program management costs, and allow for high level decision making and reporting through an Army Systems Acquisition Review Council.² The Systems Acquisition Report (SAR) became the communications media for the Army and Defense staff.

(U) Consequently, all during Fiscal Year 1971, AMC project managers were heavily involved with AMC and Defense Department programs designed to improve materiel acquisition. This was a continuing, concentrated effort that had been going on since the Department of Defense Blue Ribbon Panel of 1970 and the Commission on Government Procurement each recommended that the Secretary of Defense participate earlier in the decision making process regarding new weapons. Even

¹ See "The Acquisition of Weapons Systems", Committee on Government Operations, 91st Congress, 1st Session, GPO, Washington, 1969.

² Army Regulations 1000-1, Basic Policies for Systems Acquisition by the Department of the Army, Washington, 30 Jun 72, effective 17 Jul 72.

earlier, under the guidance of Deputy Defense Secretary Packard, AMC had begun a series of comprehensive changes to the weapons acquisition process that included: greater reliance on hardware demonstrations and less on paper studies; wider use of cost reimbursement contracts for developments; separation of development from production; and improved cost estimating. Taken together, these changes were embodied within DOD Directives 5000.1 and 5000.2.³

(U) What was sought was a method of reducing or eliminating the tremendous cost growth of weapons systems acquisition that had been highlighted over the past several years by several congressional investigating committees, particularly the Joint Economic Committee of the US Senate headed by Senator William Proxmire of Wisconsin and numerous other government and private agencies such as the Blue Ribbon Defense Panel, the National Security Industrial Association, RAND Corporation, Department of Defense, the Commission on Government Procurement, and the General Accounting Office.

(U) The major causes of cost growth were found to include: the increased complexity of systems; greater capabilities demanded; inflation; estimating errors; and changes in requirements. Because of the increased costs, force levels had to be reduced and it was anticipated that some sacrifice would need to be made in the desired performance of certain systems. In particular scrutiny were the Cheyenne Helicopter and the Main Battle Tank.

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Statement of Hon. Elmer B. Staats, Comptroller General of the United States before the Committee on Armed Services, House of Representatives, 28 Mar 73, GPO, "Hearings on Cost Escalation in Defense Procurement Contracts and Military Posture" Wash., DC 1973, p.5.

(U) In an attempt to improve project management and the weapons acquisition process, several major areas were addressed. These were people, organizations, and structures, weapons development, and weapons procurement. Emphasis was placed upon selection and obtaining better people as project managers with technical expertise in the management and weapons acquisition area. Training these people better, and keeping them in assignment sufficiently long enough to be effective, and providing incentives for good officers to enter into professions related to weapons systems acquisition as a career, was also stressed as a method of improving project management and weapons acquisition. As an interim measure to the improvement of project management organization and structure for efficiency, the Defense Systems Acquisition Review Council was set up to make and approve policy and to monitor performance against approved policy in conjunction with the Office of the Secretary of Defense. In weapons development, Secretary Packard warned, the decision to go ahead must be right and requirements must be defined, valid, and important. In addition, he insisted that weapons must be produceable at an acceptable cost within planned estimates and with planned capabilities. In essence, it was seen that improved weapons acquisition depended upon the employment of more capable people really managing the new weapons systems programs, working within an organizational structure conducive to independent action unencumbered by unnecessary interference from above or without. It was visualized that in the future, project managers would gain an independence to get

the job done, with such agencies as the Defense Acquisition Review
4
Council becoming obsolete.

(U) What was happening in the area of materiel acquisition was a switch to a "design to production unit cost system." This system would, hopefully, shorten the requirements generation and system development time and improve the Army's decision making process. Coming under scrutiny and question was the practice of total package procurement implemented during Secretary McNamara's tenure as Defense Secretary. One of the principal changes over the old system to be implemented would be a policy for establishing a design to unit cost objective early in the acquisition cycle for a major weapon system. That estimate would be the basis on which system changes and trade-off analyses would be made. The estimate would be included in the development contracts so the contractors could design equipment which could be produced below the estimated amount and so that contractors could be placed on notice when production costs exceed estimated amounts that the program may be cancelled. It was visualized that future contracts for all major weapons systems would include "design to pro-
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duction unit cost" estimates.

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Prepared Statement of Hon. David Packard, Deputy Secretary of Defense, before the Military Operations Subcommittee of the Committee on Government Operations (Chet Holifield Subcommittee), 22 Sep 70, "Policy Changes in Weapons System Procurement", GPO, Wash., DC, 1970, p. 37-42.

5
(1) Army Regulations, 1001-1, Basic Policies for Systems Acquisition by the Department of the Army, GPO, Wash., DC, 30 Jun 72 (2) Testimony, Hon. Barry J. Shillito, Assistant Secretary of Defense for Installations and Logistics, to the Subcommittee on Priorities and Economy in Government on "The Acquisition of Weapons Systems", GPO, Wash., DC, 21 Dec 72, p. 2159.

(U) During this transitional period, the AMC Deputy Commanding General for Materiel Acquisition, MG Paul A. Feyereisen, in addition to his customarily frequent contacts with project managers in Headquarters, AMC, made a personal visit to each project manager's office so that he could evaluate the status of project management capabilities on the scene. And project managers were called to AMC Headquarters for tutelage. As a result, throughout Fiscal Year 1971, respective project managers aggressively took actions to correct deficiencies and upgrade performance. As a result, many substantive changes regarding the application of project management within the Army were made. 6

(U) At the beginning of Fiscal Year 1970, AMC had been heavily involved with PROMAP-70, the Program for the Refinement of the Materiel Acquisition Process. This interim management improvement program instituted at the direction of the then Commanding General of AMC, General Ferdinand J. Chesarek, involved over 300 top level managers within the command. This program was terminated on 31 December 1971. Then in March of 1971, General Henry A. Miley, the new Commanding General, AMC, screened and reviewed the results of PROMAP-70 for the Assistant Secretary of Defense, Installations and Logistics, the Honorable Barry J. Shillito, and it was clear that while significant accomplishments had been made, much unfinished business remained. It was therefore decided that a few actions would be selected for follow-on during Fiscal Year 1971 and that these would be pushed aggressively. This program was

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Letter, AMCSA-PM, DCG, AMC, MG Paul A. Feyereisen, to General Accounting Office, 23 Jul 70, Subject: Project Management, Policies and Procedures of Interest to General Accounting Office.

called FOLON 71 (Follow-on 71).

(U) The program for 1971 as identified by General Henry A. Miley, Jr., CG, AMC, encompassed four categories including training and personnel trade-off analysis, contracting procedures, technical data and control of changes.

(U) The system that evolved ultimately was IMPACT, (Improved Management of Procurement and Contracting Techniques). Involved were such things as the selection and training of future project managers, materiel acquisition training, enhancement of procurement and research and development careers, training of negotiators in the "should cost" principle, trade-off analysis between materiel need and risk analysis, and technical data and control of changes which involved such things as reduction of cost growth and data requirements from contractors.

(U) In Fiscal Year 1972, AMC examined the organization and functions and staffing patterns of the Project Manager offices of AMC and found that their organizations varied widely. Only 9 of 30 Project Manager-offices were organized along lines of a selected typical organization. It was also found that there was great variation of understanding among these offices regarding functions statements: most were confused with missions. Therefore, it was concluded that there was need for most project managers to reorganize their offices to improve ways of doing things through a system of concise functions statements of tasks to be performed. It was also directed that a project management

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(1) Briefing, AMC, Comptroller, BG H. E. Hallgren, to the Department of the Army Inspector General, 8 Jul 71 (2) Release 71-47, 15 Mar 71, AMC Information Office, Subject: Follow-on Action to PROMAP-70.

organization/functions staffing model be developed together with staff-⁸
ing guidelines all embodied within a project management handbook.

(U) Early in Fiscal Year 1971, AMC issued regulations prescribing the objectives, policy, and responsibilities for the development of project managers. The regulations resulted from a Deputy Chief of Staff, Personnel (DCSPER) requirement to identify project manager development positions and develop assignment patterns for selected incumbents assuring progression through successively more responsible positions. The pool of officers who had progressed through the developmental positions would serve as a primary source for selecting future project managers. By mutual agreement between AMC and DCSPER, positions of research and development, procurement, and logistics officer programs were chosen as providing experience required for project manager⁹ development.

(U) At a joint briefing by AMC and DCSPER held on 29 September 1971, to the Chief of Staff, Army, a whole range of project management problems including the required training of project managers were discussed. Regarding the selection of project managers, it was pointed out that an otherwise highly-qualified officer might not qualify in accordance with established criteria; he might have an advanced degree but have had no unit command experience. DCSPER asked that criteria

⁸ AMC CAMERA FEEDBACK by Review and Analysis Division, Comptroller, HQ, USAMC, 4/73, Subject: Project Manager Offices, Organization/Functions/Staffing.

⁹ AMC Regulations No. 614-3, HQ, USAMC, Washington, 27 Jul 71.

establish a point of departure for selecting project managers. The Army Chief of Staff then required a trade-off between academic requirements and practical experience and suggested that within flexible limits, project managers be graduates of the Command and General Staff College or else have commanded a unit. To the suggestion that civilians be used as project managers to assure continuity of command, the Army Chief of Staff disagreed effectively killing the proposal. Correlative to all this, it was generally agreed that there were several real dangers in channeling project managers into too isolated program areas. It was seen that this could lead to the use of project manager offices as sources for industrial recruitment. Another danger would be a loss of
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objectivity by the project manager.

(U) AMC project managers were also experiencing funding problems in Fiscal Year 1971. There was some question as to the best method for funding project managed items. General Ferdinand J. Chesarek, Commanding General, AMC, queried the subordinate commanders and project managers regarding the question during August 1970. Based upon his consideration of the comments received from the field, General Chesarek decided that he would continue the financial management procedures for project manager offices under then existing policies. The project manager would retain full control of his program and funds in RDT&E and PEMA, and he would have recourse to seek adjustments in O&MA via appeal to the Commanding General when his ability to accomplish his mission was

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Memo for Record, LTC Wm. F. Harrison, Asst. Sec. Gen. Staff, C/S Army, 30 Sep 70, Subject: Briefing for C/S Army on Project Manager Programs, 29 Sep 70.

jeopardized. Commodity commanders were directed to clearly identify and define and to provide the necessary financial support for project managed programs as called for in command operating budget and program documents.
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(U) In April 1971, the new AMC commander, General Henry A. Miley, sought to improve communications between project managers and the AMC Command Group as a fruitful way of improving the materiel acquisition process. He thought that if project managers could present their most pressing problems to the Command Group on a regular basis, rather than on a crisis basis, an immediate and readily available method for solving problems would exist. To this end he initiated a system of quarterly reviews of selected projects entitled: Review and Command Assessment of Projects (RECAP).

(U) These reviews were to be meaningful with major issues surfacing for discussion and solution. Commodity commanders were to be knowledgeable about the RECAPs and advise the Commanding General, AMC or the Deputy Commanding General for Materiel Acquisition of matters and problems that they deemed important. Silence from commodity commanders would indicate agreement with project manager presentations, General Miley pointed out, which would assure him of having all the facts upon which to base his decisions. The projects initially cited for RECAP monitoring included: TOW, M60A1E2 Tanks, LANCE, DRAGON, SAM-D, AAWS, MBT, HAWK, and Gama Goat (M561). Shortly, the programs

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Letter, AMCCP-PO, CGAMC, Gen. F. J. Chesarek, to AMC Commodity Commanders and Project Managers, 8 Oct 70, Subject: Project Manager Fund Limitations.

of all project managers were brought under quarter-review for scrutiny by the Commanding General or his deputy. At the close of Fiscal Year 1971, there were 32 Project/Product Managers reporting to commanders of AMC Commodity commands. There were 9 Project/Product Managers reporting to the Commanding General, AMC at Headquarters.¹²

(U) This chapter covers only those project managed systems that reported directly to the Commanding General, AMC during Fiscal Year 1971. The histories of project manager offices reporting through commanding generals of commodity commands are included in the Annual Historical Summaries of the respective commodity command. Projects included in this chapter are: Advance Aerial Weapons System, Chaparral/Vulcan, Main Battle Tank-70, Container Systems, Mobile Electric Power, Night Vision, SATCOM (Satellite Communications Agency), and STARCOM (Strategic Army Communications). SAM-D (Surface to Air Missile-D) is not included since no historical documents were submitted. SAM-D is the subject of a monograph project of the Historical Division, US Army Missile Command; nor is Project Mallard included. Project Mallard was transferred to the Office of the Secretary of Defense in June 1971 without submitting any documentation.

12

(1) Letter, AMCSA-PM from Gen. Henry A. Miley, CG, AMC, to AMC Commodity Commanders and Selected Project Managers, 26 Apr 71, Subject: Quarterly Review of Project Managed Programs (2) Letter, Act/Chief of Staff, Army, BG Robert L. Kirwan to AMC, AMC Directorates and Separate Staff Offices, 7 Mar 73, Subject: Major External Audit Reports Processed in AMC-2d Half CY 1972. (3) Listing AMC Project/Product Managers, Special Assistant for Project Management, HQ, AMC, June 1971.

Advanced Aerial Weapons Systems

Cheyenne AH-56A

Cobra AH-1G

(U) The Project Manager for the Advanced Aerial Weapons Systems (AAWS) was responsible for two major weapon systems consisting of the Cheyenne (AH-56A) and the Cobra (AH-1G). The Cheyenne was a single engine (T64-16), a single rotor, compound attack helicopter with retractable landing gear. It was an integrated direct aerial fire support system with advanced technology in the fields of rotary wing design, armament, avionics and ground support equipment, employing the rigid rotor principle for the main rotor. The fire control system featured a 360° swiveling gunner's station for the co-pilot gunner, a stabilized periscopic sight, laser range finder, night vision device and computer directed fire. Armament included 40mm nose and 30mm belly gun turrets, 2.75 inch rockets and the TOW (Tube Launched-Optically Tracked-Wire guided) antitank missile system. The Cobra was a gunship version of the Bell UH-1 series helicopter using the "Huey" dynamic components in a low drag fuselage and employing a variety of nose turret and pod mounted weapons. An improved cobra armament program was also initiated that gave the helicopter a TOW missile capability. 13

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The Advanced Aerial Weapons Systems (Cheyenne [AH-56A]/Cobra [AH 1G]) approved by Secretary of the Army Stanley Resor on 22 Jan 70 superseded the Advanced Aerial Fire Support System (Cheyenne AH 56-A) Charter approved by USAMC Commander, Gen. Frank S. Besson, Jr. effective 10 Feb 67. Previously the project was designated as Fire Support Aerial System originally established 21 Jun 63 by USAMC General Orders No. 39, 22 Jul 67.

Background and Missions

(U) Prior to the deployment of US combat troops into the Vietnam War, the Army's 11th Air Assault Division (Test) developed and demonstrated the rotary wing airmobile concept. Shortly thereafter, US troops were engaging the enemy in search and destroy missions and a new dimension was added to modern warfare. Transport helicopters were often engaged by the enemy. There arose a need to arm the helicopters. The immediate response was the adaption of the helicopters to accommodate door gunners armed with light machine guns. Thus, the armed helicopter soon became an established combat vehicle. Shortly, separate armed helicopter units were created which proved effective escorts. The success of the armed helicopter called for an expansion of tasks to include attacking ground targets in proximity to engaged troops. This type of discriminating fire, delivered upon the request of the ground commander and identified as direct aerial fires, as distinguished from close air support, proved to be decisive to the success of many fire-fights. That the traditional methods of fire and maneuver could be vastly improved through the employment of its most mobile combat vehicle was a lesson soon learned by the Army. However, the forced landing and loss rate of the helicopters was higher than desired. This led to an intensive effort by the Army to study aircraft survivability problems and in the meantime to provide the current combat helicopters with some means of protection.

14

Col. Robert J. Dillard, "Army Cheyenne-Designed to Survive", US Army Aviation Digest, May 1971, p. 3-7.

(U) The first attack helicopter was introduced into the Army inventory in the mid 1960's. This was the AH-1G Huey Cobra. This was the first helicopter designed for the direct aerial fires mission. The Cobra, a modification of the successful UH-1 series of helicopters, was equipped with antipersonnel weapons in a chin mounted turret and capable of carrying 2.75-inch folding fin aerial rocket pods. Armor for vital engine parts, crew seat armor, and self-sealing fuel tanks were other features of the early Cobra designed to defeat small arms fire. The AH-1G Huey Cobra was designed as a two-place, tandem seated, attack helicopter. Power was provided by a single gas turbine engine flat rated at 1100 shp. Distinguishing features were the narrow fuselage small stub-wing weapons pylons, and flexible chin turret. 15

(U) What later happened was as follows: Early in calendar year 1971, the Army Staff had reversed a decision approved by Army Secretary Stanley Resor just three days previously to retrofit some 200 AH-1G Cobra gunships to an improved anti-tank version carrying TOW missiles. This improved capability Cobra was an interim measure approved 30 January pending production deliveries of the AH-56A Cheyenne. The reversal came apparently as a result of new information that Congress would not make sufficient money available for both the Cobra improvement and Cheyenne programs. However, the Army indicated that money would be available for a limited Cobra-TOW retrofit program for testing in conjunction with the Army MASSTER (Mobile Army Sensor System, Test, Evaluation and Review) program. It was about this time

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Ibid.

(4-5 February 1971) that Congressional observers had witnessed an unimpressive demonstration of the Cheyenne at the Yuma Proving Ground in Arizona. The decision as to whether to procure the AH-56A or the improved version of the Cobra was to be made the following fall.¹⁶

(U) Earlier in 1969, the Army Chief of Staff expressed interest in an improved armament Cobra with a tank killing capability and an ability to suppress attack. On 10 December 1969, the proposal was considered several times and higher headquarters was briefed about progress. A cost study was prepared for Army staff and submitted on 2 May 1970. The system was to include a 30mm weapon, fire control and TOW missile systems. Army staff approval was gained; however, no funds were forwarded or programed. In January 1971, an austere Uppgun Cobra was requested and was configured with the standard XM-28, 20mm gun, helmet sight and TOW. This limited program finally received approval and was funded in July 1971. Bell Helicopter was the prime contractor. Later, by the end of calendar year 1972, the Cobra weapons system was to consist of the 7.62mm machine gun, the 40mm grenade launcher plus the 2.75 inch folding fin aerial rocket. This was the AH-1Q configuration of the basic AH-1G including the TOW missile system,¹⁷ referred to as Cobra/TOW.

(U) The Cheyenne attack helicopter, as visualized in 1971, was the culmination of the Army's requirement for an advanced aerial fire

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Armed Forces Journal, Washington, DC, 15 Jul 71.

¹⁷

Submission, Project Manager Advanced Aerial Weapons System, Fiscal Year 1971, p. 9; Fact Sheet, USAMC, Washington, DC, 11 Dec 72.

support system initiated in the mid 1960's. It was viewed by its project manager in 1971, Colonel Robert J. Dillard, a senior Army aviator as well, as the "most advanced, fully integrated rotary wing weapon system in the world." It would be capable of delivering large lethal payloads and deadly accurate fires with the finest computerized fire control system ever developed according to Colonel Dillard.

(U) The role of the AH-56A would be to provide escort for troop carrying helicopters and direct aerial fire support for ground forces, to include effective anti-tank/anti-mechanized fires. It was to provide the land force commander a highly mobile, responsive, aerial fire support system, unconstrained by natural or man-made barriers, and relatively unaffected by darkness and adverse weather.

(U) The basic armament of the Cheyenne included the TOW antitank missiles externally mounted in pods on the wings; 30mm cannon in the belly turret with a 360 degree field of fire capable of delivering dual purpose rounds (antipersonnel/light armor) of high accuracy; and an accurate 40mm antipersonnel grenade launcher located in the nose turret. An alternate for the nose turret was 7.64 automatic gun. A self-contained Doppler navigation system and a gunner's night vision system for around-the-clock operation also came with the system.

(U) In the first months of Fiscal Year 1971, congressional committees showed an intense interest in close air support aircraft. In this year, Congress was faced with a Department of Defense request to fund three separate close air support aircraft. These were the Army's AH-56A Cheyenne Gunship, the Marine Corps AV-8A Harrier and the Air Force A-X aircraft. The A-X was envisioned by the Air Force as a

means of reestablishing that services responsibility as the primary provider of close air support to ground combat troops. Congress had serious questions regarding the funding of what they believed were three systems designed essentially to perform the same basic mission. In accordance with the National Security Act of 1947, the Air Force was directed to furnish direct combat support; however, Congress concluded, missions of close air support were not stated as exclusively Air Force missions though, in the words of the congressional report, "Air Force had chosen to make that interpretation." Congress gave credence to the Army position that it needed the gunship to satisfy its immediate requirements for close air support primarily because of its reluctance to depend upon the Air Force to provide the needed support in an effective and timely manner. In the past, the Army had been placed in the position of competing with other Air Force missions and had to depend upon the type of aircraft selected by the Air Force to provide support. It was for these reasons that the Army embarked upon the helicopter gunship concept, first with the Cobra to provide the interim capability and ultimately with the Cheyenne AH-56A. Again in the words of the Appropriations Committee of the House of Representatives, "In order to diminish the roles and missions opposition by the Air Force, the Army described the Cheyenne concept as an 'advanced aerial fire support system' designed to provide the Army with 'direct aerial fire support' as opposed to 'close air support'."

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Report, Committee on Appropriations, US House of Representatives, Department of Defense Appropriations for FY 1971, GPO, Washington, 1971, pp. 1-3.

(U) After considerable study of the merits of each services system, the committee directed the Secretary of Defense to reevaluate the roles and missions and aircraft options available relative to close air support, including the Air Force's A-X, the Marine's AV-8A Harrier, and the Army's AH-56A Cheyenne before recommending any substantial procurement of any close air support system. Findings, including a decision as to the aircraft best suited to fill the needs of close air support, were to be delivered to the Appropriations Committee in time for the Fiscal Year 1972 budget hearings. In the interim, sufficient funds to maintain the A-X, the Harrier, and the Cheyenne aircraft programs were provided by the committee.

(U) Back in March 1971, Secretary Resor had expected the basic development of the Cheyenne, which he called the most significant research and development fund request, would be completed that year indicating that the Lockheed Company had found solutions to the technical difficulties that had caused termination of the production contract for default and that the Cheyenne would be ready for procurement the next year. Cheyenne was given the highest priority in the Army. However, technical difficulties were delaying a decision on production until October 1971. The nature of the decision depended upon the results of the producibility/cost reduction study, further testing of research and development models, and a settlement of contractual issues between the Government and Lockheed.

19

(1) Aerospace Daily, Washington, 17 Mar 71, pp. 97,98 (2) Aerospace Daily, Washington, D.C., 14 May 71, p. 73.

(U) Lockheed was to be paid \$1.2 million to come up with a producibility/cost reduction study as an independent Government sponsored look into the options to reduce the cost of production of Cheyenne. The effort called for engineering analysis of proposed changes in production techniques, system integration, and flight testing. Technical problems with the Cheyenne rotor control system were being resolved and previously encountered divergent rotor oscillations had been dampened. Meanwhile, Congress cut \$13.2 million from the Cheyenne production tooling with the stipulation that it was not pre-judging a procurement decision. The committee remained ready to reconsider reprogramming from previously authorized funds to permit Cheyenne procurement if such a decision was indicated by the producibility/cost reduction study. For the interim, Cheyenne research and development would continue into Fiscal Year 1972 using previously appropriated money.

(U) Plans for both the Air Force A-X and the AH-56A Cheyenne were formulated initially when it seemed that the United States would be involved in a Vietnam type war for a number of years to come with its permissive environment and a corresponding requirement for counter-insurgency aircraft. With the closing down of ground combat operations in Southeast Asia, both services were stressing views that their respective aircraft could perform effectively, and survive in, a conventional environment of much greater expanse.

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(1) Aerospace Daily, Washington, D.C., 24 May 71 (2) Letter, BG William A. Maddox, Jr., Director of Aviation, ACSFOR to AMC and CDC Commanders, 3 Dec 70, Subject: Cheyenne Producibility/Cost Reduction Study.

(U) In accordance with the congressional instructions, the Deputy Defense Secretary, Honorable David Packard, formed a group to examine close air support. Senior members of the Services, Joint Staff, and the Office of the Secretary of Defense met and focused their attention, not primarily upon roles and missions, which had been done numerous times before, but upon what capabilities were required based upon estimates of need for close air support and upon projected costs of both current and projected close air support systems. The 1976-1980 time frame based upon contemporary intelligence estimates and existing inventories was examined to ascertain inventory sufficiency to provide an adequate future capability.

(U) It was apparent to the group, based upon the situations they examined, that the inventory did not provide an adequate capability. The group felt that the new systems: A-X, Cheyenne, and Harrier, had the potential for substantial increases in effectiveness if certain characteristics could be achieved. Each system offered a substantial improvement over current and modified systems according to the group. The group reasoned that the Cheyenne, because it could operate within battlefield organizations from dispersed and unprepared sites within minutes of hostile forces by day, by night, and in bad weather gave the Army a high degree of close air support responsiveness. The group also reasoned that the A-X, Cheyenne, and Harrier were sufficiently divergent in their capabilities so as to justify continuing all three programs. The group further offered that decisions to produce either A-X and Cheyenne or subsequent procurements of the Harrier, already in production, would depend on whether these aircraft meet their cost and

performance goals and whether the operational requirement to justify
21
their production was validated.

AAWS and Systems Engineering

(U) Systems engineering, a design technique employed to insure the compatibility of entire systems, was not employed to a great extent with the development of either the Cheyenne or the Cobra. Though systems engineering was employed by the other services since the early 1960s, the Army did not make use of the technique with the development of aircraft for several reasons. The need for systems engineering was not clearly seen. Army aircraft has been tailored for stereotyped missions and specific roles of liaison and movement of troops and cargo. Gunships were in their infancy and the Army was buying Air vehicles. Also, there was no recognized aviations systems command until the mid 1960s.

(U) Then, the Vietnam War with its demand for immediate aircraft modification placed systems engineering on the back burner. In Vietnam, the ENSURE (Expediting Nonstandard Urgently Required Equipment) program exploited technological innovations quickly by modifying small numbers of aircraft with new equipment. Testing and evaluation was done in the theater. There was an endless number of modifications to the Cobra during the Vietnam War. However, with the phasing out of operations in Vietnam, by Fiscal Year 1971, perhaps too late, both the Cheyenne and the improved armament Cobra were put under full scale systems engineering

21

Aerospace Daily, 24 Jun 71, "Packard's Report to Congress on Close Air Support", p. 317, 319.

management. The Cheyenne was a most complex weapons system and though Defense Directive 3200.9 required the contractors to employ and propose systems engineering efforts, regrettably, research and development funds available for the program had not fully covered the program. ²²

(U) Cheyenne was a weapons system in genuine need of systems engineering. It was a compound helicopter having wings and propeller, and a gyro-controlled rigid rotor, untried in production. It was equipped with the latest in automatic gun development, plus a full solution, computer directed fire control system with laser ranging. It also had the tube launched, optically tracked, wire guided (TOW) air-to-ground missile system and a self-contained doppler navigation system. In addition, it had the latest lightweight solid state communications equipment, an advanced engine and auxiliary power unit, extensive self-test and ground support features, plus numerous other innovations. It was a real candidate for systems engineering. The development task was made more difficult since many of the components and subsystems such as weapons, avionics, and engines were government furnished and as yet not fully developed at the time contracts were issued. The computer was split between government-furnished and contractor-furnished and the night vision control system was added ²³ to the Cheyenne two years after development had been underway.

²²

Baldwin, Truxton R., "Systems Engineering in Army Aviation" Army Logistician, Nov-Dec 1971, p. 8-11, 37.

²³

Ibid. p. 9.

(U) With such a complex system, technical difficulties were attached too often on an individual component basis rather than on a weapons system approach. Overweight and drag conditions resulted which led to reduced performance and load carrying capability. This in turn led to the termination of the production contract in May 1969. However, by Fiscal Year 1971, a systems engineering organization had been established at Lockheed with documentation authority to enforce implementation of the approach during every step of the developmental cycle for the Cheyenne.

(U) The improved Cobra was also to become involved with highly technical systems engineering techniques. The improved Cobra was constrained to a maximum gross weight of the existing Cobra airframe which was 9,500 pounds. The projected weight of the improved Cobra was 9,324 pounds, which placed a premium upon efficient systems engineering throughout the design, development and test cycle. Bell Helicopter Company was the systems integrating and systems engineering contractor. Maximum use was to be made of applicable components and subsystems developed by the supporting commands. The existing Cobra air vehicle was to be used for the improved Cobra; however, the advances in weaponry and fire control and the complexities of the improved Cobra approached the scale of a new system. Improved Cobra would also employ the TOW antitank missile and the 30mm XM-140 gun that fired dual-purpose rounds for use against lighter mechanized vehicles. The Cobra was expected to be an economical complement to the heavier payload Cheyenne in the attack helicopter force structure.

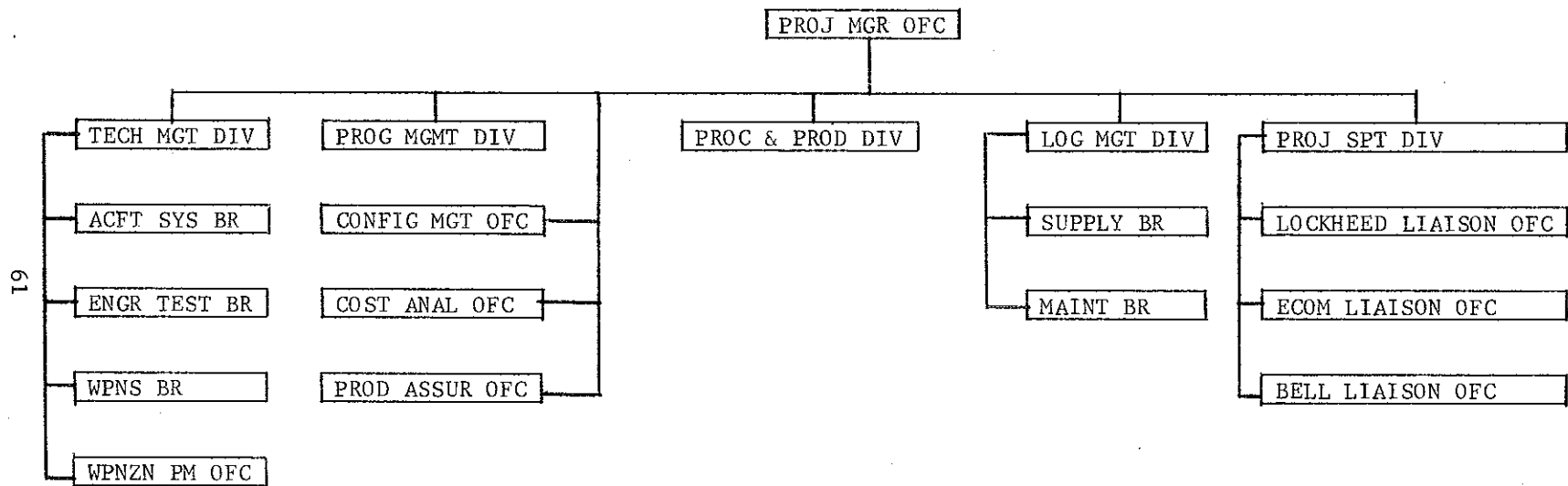
Systems engineering was a way of life for the Project Manager for the Advanced Aerial Weapons System.

Organization

(U) The structure of the AAWS Project Manager's Office provided for a Technical Management Division, a Project Management Division, a Logistics Management Division, a Project Support Division, a Procurement and Production Division, and separate offices for Configuration Management, Cost Analysis, and Product Assurance. The Project Manager for more than half of Fiscal Year 1971 was Brigadier General Henry H. Bolz, Jr. Brigadier General Bolz replaced Colonel Robert J. Dillard per Special Orders 219, Headquarters, USAMC, 1 December 1970. Colonel Dillard had served as project manager since 15 July 1969. Physically located at ²⁴US Army Aviation Systems Command in St. Louis, the AAWS is a Class II organization reporting directly to the Commanding General, AMC. See Figure 1.

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(1) Project Charter, Advanced Aerial Weapons System, 22 Jan 70, p. 1. (2) Letter, AMCPT-S, to PM AAWS, 26 Jul 71, Subject: DA Approval of TDA.



(U) AAWS ORGANIZATION CHART

FIGURE 1

FROM: Submission to AMCHO by
AAWS Project Manager's
Office, FY 1971.

Mission

(U) The Project Manager AAWS was responsible with full-line authority as delegated the CG, AMC, for the development and acquisition of the AH56A Cheyenne and the AH-1 Cobra. The AAWS Project Manager was responsible for the definition, development and initial procurement production, distribution, and logistical support to accomplish project objectives. He was also responsible for assuring that planning was accomplished by the organizations responsible for the complementary functions of evaluation, logistic support, personnel training, operational testing and activation or deployment of the systems and their related equipments. The Project Manager was supported by offices and organizations within AMC. The Project Manager was assigned responsibility for the following Army RDT&E projects and tasks: Advanced Aerial Fire Support System (AH-56); Weapons Helicopter (AH-1); Aircraft Engines; TOW/Cheyenne; Cheyenne (AH-56A) Night Vision Sight.

(U) The Project Manager was responsible for the overall procurement management of the PEMA programs for the AAWS including the Cheyenne (AH-56) and the Huey Cobra (AH-1). Included were: Air Frame; Engine; Avionics; Armaments; Fire Control; Ground Support Equipment; and other equipment as assigned.

(U) The AAWS Project Manager was responsible for coordinating other customer procurement as required, including co-production as applicable. By virtue of the critical interface with this project, the Project Manager of the Advanced Aerial Weapons

Systems was also delegated management responsibility within AMC for the Joint Army-Navy Integrated Helicopter Avionics System Project (IHAS). Other responsibilities of the AAWS Project Manager included O&MA, and other programs, weapons, and subsystems assigned. The Project Manager was responsible for the implementation, management, and evaluation of the Quality Assurance Program and for providing a completely integrated and extremely effective total Product Assurance Program at an optimum cost.

Organization Management*

General

(U) During Fiscal Year 1971, the AAWS Project Manager was Brigadier General Henry H. Bolz, Jr. Having been assigned 1 Dec-²⁵ember 1970 to replace COL Robert J. Dillard.

(U) During the Fiscal Year 1971, many significant actions took place within the Advanced Aerial Weapons Systems AAWS Project Manager's Office affecting the AH-56A Cheyenne and AH-1G Cobra Weapons and Armament Systems. Some of these major significant actions were as follows:

(U) Establishment of the AAWS Project Manager's Office as an AMC Class II Installation, reporting directly to the CG, US Army Materiel Command and approval of the TDA by AMC for Project Manager, Advanced Aerial Weapons Systems, 25 February 1971 was required.

25

HQ, USAMC, Special Orders, No. 219, 1 Dec 70.

*Material in this portion: Organization & Management, Procurement & Production, Technical Development..., Funding, and AH-1G Operations and International Logistics was submitted by the Project Manager for the Advanced Aerial Weapons System. (C) FY 71 Annual Historical Summary.

Establishment of Yuma Field Office

(U) The AAWS Project Manager's Yuma Field Office was established at Yuma Proving Grounds, Arizona, on 29 January 1971. Staffing consisted of (1) LTC, Chief; two (2) Engineers; one (1) Equipment Specialist; and two (2) Secretary/Stenographers. The primary function of personnel staffing this Office was to monitor Lockheed Aircraft Company and Army test activities at Yuma Proving Ground. In addition, the Chief was to act with full on-site authority of the Project Manager, effecting coordination and interface between Army Test and support elements and contractors. Five of the spaces for this Office were transferred from the Lockheed Liaison Office, Van Nuys, California.

Aircraft Weaponization Management Office

(U) US Army Aviation Systems Command (AVSCOM) General Order No. 23, dated 17 February 1970 assigned the Aircraft Weaponization Project Management Office to the Advanced Aerial Weapons System Project Manager's Office for administration and technical supervision.
26
This was reversed on 13 January 1971.

Establishment of Project Control Center

(U) During Fiscal Year 1971, a Project Control Center (PCC) for the AAWS Project Manager's Office was established. The primary purpose of the Center was to keep the Project Manager aware of major projects, events, problem areas, procurement and production, logistics, research,

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(1) USAVSCOM General Orders No. 23, 17 February 1970 (2) USAVSCOM General Orders No. 8, 13 January 1971.

engineering and test schedules and configuration management on aircraft/weapons/armament systems pertaining to the Cheyenne and Cobra aircraft. This Center, when fully operational, was to serve as the Management Information Center for the Advanced Aerial Weapons Systems Project Manager.

Integrated Technical Data System (ITDS)

(U) The ITDS Contract No. DA-49-186-324(X) with TRW Systems Group was extended on 30 June 1970 to 31 August 1970, and subsequently extended to terminate on 30 December 1970. During the period 30 June through 30 December 1970, the major effort of ITDS was directed toward support of the Cheyenne litigation team, with limited support provided to the Cheyenne project. By direction of AMC, the ITDS was transferred from TRW Systems Group, Washington, D. C., to AVSCOM facilities during the second quarter Fiscal Year 71. ITDS software was transferred to AVSCOM under TRW cover 16 December 1970. Hard copy documents (approximately 50 file cabinets) were also transported to AVSCOM in December 1970. The AVSCOM Management Information Systems Office assumed custody of the entire system.

Project Support Agreements

(U) Project Support Agreements were prepared during Fiscal Year 71 between the AAWS Project Manager's Office and US Army Aviation Systems Command (AVSCOM); US Army Missile Command (MICOM), US Army Weapons Command (WECOM), US Army Munitions Command (MUCOM), US Army Electronics Command (ECOM), US Army Test & Evaluation Command, and the TOW Project Manager.

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(FOUO) Procurement and Production

AH-56A Cheyenne

(FOUO) Attempts to achieve a total package settlement, involving both the pending litigation on the production contract and a restructuring of the Research and Development Contract has been unsuccessful. In early July 1970, LTG Henry A. Miley was designated the DA agent for negotiating a Memorandum of Understanding (MOU) with Lockheed that would serve as a basis for settlement of production contract disputes and restructuring of the development contract. On 21 August 1970, a draft MOU was forwarded to the Deputy Secretary of Defense. The restructured contract, as defined by the MOU, was negotiated and the AMC Senior Contract Review Board approved the contract and forwarded it to DA on 19 November 1970. The remainder of the fiscal year has been spent awaiting OSD and DA approval to implement the contract and numerous attempts were made to secure approval for contract award, but the Cheyenne settlement continued to be unresolved.

AH-56A Cheyenne Producibility/Cost Reduction

(U) Producibility/Cost Reduction Contracts were awarded to Stanford Research Institute and Lockheed on 5 May 1971. The contracts were directed towards identifying possible reductions in the overall system cost of the AH-56 Cheyenne Weapons System without a loss of capability and effectiveness. The results of these contracts were expected to provide the necessary information to assist the Government in making decisions concerning the final configuration for the Cheyenne Weapons Systems, feasible alternatives and their effect on mission

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effectiveness, engineering detail design, production facilities, life cycle cost and alternative logistics support methods pertaining to the approved production configuration.

Procurement of AH-1G Helicopters, FY 70 (Cobra)

(U) A letter contract for the procurement of 170 AH-1G helicopters for the Army and 4 AH-1G helicopters for the Military Assistance Program (MAP) was let on 26 April 1971. The delay of letting this contract was caused by the "Should Cost Analysis" impact for UH-1 helicopter procurement that was placed on all pending procurements with Bell Helicopter Company (BHC).

Procurement of AH-1G Helicopters, FY 71

(U) Contract for 70 AH-1G helicopters was awarded on 28 May 1971. This procurement action was accomplished on schedule without the use of a letter contract.

Improved AH-1G Cobra Armament

(U) A D&F was prepared and submitted for the development of the Improved Cobra Armament System. Approval was received 28 May 1971, and the necessary procurement effort to award the contract was in process at the end of Fiscal Year 1971. The award of a letter contract was anticipated by 15 September 1971, with a definitized contract as soon thereafter as practical.

AH-1G Weapon System (Improved Cobra Program)

(FOUO) Additional engineering effort on the Improved Cobra Armament System consisted of writing a Coordinated Test Plan, conducting and submittal of a Night Vision Study, re-definition of the system configuration by DA, preparation and submittal of the program.

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(FOUO) A Coordinated Test Plan was prepared with the assistance of MICOM, WECOM, AVSCOM and TECOM and submitted to AMC for review on 21 August 1970. The CTP was built around testing from the contractor development phase through the production phase on a system configuration entailing the TOW Missile System, XM-140 (30mm) automatic gun, and an improved Fire Control System. The Fire Control System would consist of a stabilized optical sight, laser rangefinder, helmet sight and ballistic computer. This originally was a two-step effort wherein the XM-120 subsystem (including XM-140 gun) would have been fielded one year prior to the TOW Missile/Fire Control/Laser/Helmet Sight integration. Total system deliveries were programed for 39 months after program go-ahead.

(U) By direction of DA, OCRD, on 20 October 1970, the Project Manager was directed to evaluate the incorporation of a Night Vision System into the Improved Armament Cobra. With the assistance of AVSCOM, ECOM, TECOM, WECOM, Frankford Arsenal and Bell Helicopter Company, a study was conducted and a report submitted on 2 December 1970. The report concluded that the preferred technical approach for providing night fire control for the Improved Armament AH-1G was an integrated day-night sight using a stabilized mirror with far infrared imaging for night operation.

(U) On 21 December 1970, DA, OCRD, provided to AMC, a listing of seven (7) new initiatives under consideration for initiation in Fiscal Year 72. The AAWS Project Manager's Office was subsequently directed to prepare a credible development program to accomplish the Cobra related initiative "Aerial Scout/Fire Support" and present a briefing

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to OCRD. This new initiative, therefore, amended the previous Improved Armament AH-1G to two new configurations:

1. AH-1G Day Tank Killer: TOW (day), 30mm gun, fire control with laser ranger and helmet sight system plus: Night Vision Option, UTM Navigation System, and Laser designator/receiver; and the

2. AH-1G Night Heavy Scout: 30mm Gun, Night Vision, Fire Control with Helmet Sighting System, UTM Navigation System, Laser ranger/designator/receiver, and the TOW System.

A briefing was presented to OCRD on 11 February 1971. The briefing concluded that the addition of the new initiative subsystems proved feasible.

(U) In January 1971, informal direction from DA, through AMC, was received to investigate possible AH-1G configurations of TOW/Cobra. Several optional configurations were investigated and the final configuration selected was the AH-1G with the TOW System, Helmet Sight System, and Standard M-28E1 Gun System. The program was then oriented toward accelerated development to provide eight (8) ships of the above configuration to Project MASSTER in support of Air Cavalry Combat Brigade Tests. Subsequently, on 12 February 1971, DA directed cost and schedule information on an accelerated TOW/Cobra production program designed to integrate with the "TOW/Cobra for MASSTER Program." The combined program information was presented to DA on 17 February 1971.

(U) On 12 March 1971, DA established the following program guidance: system configuration as stated above, anticipated RDT&E Funding Level of \$22.273M, time from Contract Award to First Unit Equipped - 33 months, and a total of eight prototype systems to MASSTER and 192 production

systems for other force structure requirements.

(U) A DF was prepared and forwarded to AMC on 1 April 1971. As of 30 June 1971, formal program approval and funding had not been received.

Improved Anti-Torque System AH-1G/TH-1G (Trainer Modified)

(U) ECP 350R1 (MWO 55-1520-221-40/3), "Improved Anti-Torque System" for the AH-1G was received from Bell Helicopter Company in April 1969. The purpose of this Engineering Change Proposal (ECP) was to increase the in-ground effect (IGE) operating envelope and improve the directional control characteristics while maneuvering. Application of this modification to the AH-1G fleet (world-wide) started with the first operational system fielded in September 1970. The retrofit program was still in progress at end of Fiscal Year 1971 at which time there were an estimated 230 AH-1G's in operation with the Improved Anti-Torque System. This quantity was increasing at the rate of approximately 30 per month. All AH-1G's delivered to the Army under the contract with Bell Helicopter Company were to have this system incorporated during production. Based on the current retrofit rate, it was planned that all AH-1G's would be modified by January 1973.

XM-53 Wing-Mounted 20mm Weapon AH-1G

(U) During May 1968, ENSURE 223 was validated for a wing-mounted 20mm weapon on the AH-1G. The resulting armament subsystem was designated XM-35. Deployment of the XM-35 equipped AH-1G's commenced in December 1969. During the same month, six AH-1G's accompanied by the NETT Team, arrived in Vietnam. At the end of Fiscal Year 71, there were 202 modified XM-35/AH-1G's delivered, of which 119 were on hand in Vietnam. In May 1971, DA/AMC directed that additional AH-1G's be

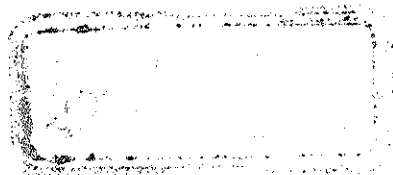
modified to accept the XM-35 subsystem. The additional quantities were considered sufficient to meet and maintain USARV current and projected requirements as established by the Closed Loop Support Conference of October 1970. With receipt of the above DA/AMC direction, a modification program was initiated at ARADMAC to modify 37 AH-1G to accept the XM-35 subsystem.

Cost Analysis

(U) In November 1971, a separate organization of professional personnel was established to provide intensified cost analysis for all weapon systems under the control of the AAWS Project Manager. Personnel consisted of a supervising Operations Research Analyst, a non-supervisory Operations Research Analyst, an Industrial Economist, and a Mathematical Statistician. These specialists were to provide to the Project Manager a parity of analytical skills and expertise to support his dealings with contractors and other Government agencies.

AH-56 Cost Estimate (Cheyenne)

(U) Producibility/Cost Reduction Study (P/CRS): The stated aim of the P/CRS contractor to Stanford Research Institute (SRI) and Lockheed Aircraft Company (LAC) was to determine the most cost effective configuration of the AH-56A. The Cost Analysis Office supervised and coordinated the input of all costs from all major sub-commands and put them into a time-phased format by cost categories and work breakdown structure. It was also necessary to check the validity of the figures produced by Lockheed for the contractor furnished portions of the baseline aircraft costs by comparison with an independent Government cost estimate prepared by the Project Manager's cost analysts. Until



completion of the effort in September 1971, the Cost Analysis Office will continue to work with Lockheed to verify the accuracy and advise on the format of the costs of alternative configuration and of the recommended configuration. The Cost Analysis will also assure that the figures are accurately entered into the life cycle cost model run by Stanford so the study will stand the scrutiny of the Defense Department, Congress, other commands and services.

Army Direct Aerial Fire Support Study (ADAFSS)

(U) In about the same timeframe as the P/CRS, the Army Combat Developments Command was sponsoring a study intended to determine the most cost effective method of fulfilling the Army's need for close air support. The Cobra, Cheyenne, Blackhawk, and Air Force A-X were the candidate systems. The AAWS Cost Analysis Office had the responsibility for reviewing and coordinating life cycle cost estimates for the Army systems being input from the AVSCOM Cost Analysis Division. The P/CRS recommended configuration of the Cheyenne was to be entered into the ADAFFS as soon as it was fully delineated and the life cycle costs determined.

The Packard Study

(U) Still another look at the comparative merits of the Cheyenne and the A-X was taken at the Defense level. The Cost Analysis Office provided estimates for the Cheyenne costs and assisted in the scrutiny of the cost figures supplied by the Air Force for the A-X. The Defense Study was to include a fly-off, and the expected costs of the Army's participation were supplied by the Project Manager's cost analysts.

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AH-1G Cost Estimates (Cobra)

(U) The AAWS Project Manager was asked to prepare an Improved Cost Estimate for the Cobra AH-1G on 14 May 1970. This study was to represent a combined AMC-commodity command effort at improving the costing technical base. To accomplish this, AVSCOM, WECOM, MICOM, ECOM, MUCOM and TECOM were called upon to formulate a cost study for the Cobra from the cradle-to-the-grave to include the Improved Armament Program. The final report was submitted to AMC on 26 February 1971. The study was to be used in computations for a data base on all Army aircraft.

Technical Development, Engineering and Product Assurance

The Cheyenne AH-56A Weapon System

Armament

(U) The Cheyenne contained four basic weapon subsystems: the XM-51 (40mm), XM-52 (30mm), 2.75" FFAR and TOW (anti-tank missile). Test and evaluation of the XM-53 (7.62) had been discontinued in favor of the XM-51 system which has the capability of both area and suppressive fire. During Fiscal Year 71, many functional and accuracy tests were conducted with each subsystem. A high degree of accuracy was achieved with both laser and manual rangefinding in a variety of flight profiles. Firing tests were developed and conducted commensurate with the increased flight envelope utilizing the pilot control helmet sight and swiveling gunner station.

(C) During the fiscal year, the Phase A TOW program was completed and the Phase B TOW/NVS program initiated. Phase A TOW was essentially a feasibility program and consisted essentially of daytime TOW firings

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made with prototype equipment adapted from XM-26 hardware. Some of the firsts accomplished in the Phase A program during the year included successful firings from the Cheyenne: at maximum range of 3000 meters (23 July 1970); utilizing production HEAT missiles (12 August 1970); employing post capture aircraft maneuvers (12 August 1970) at moving targets (11 November 1970); at Phase A maximum speed of 150 knots (23 November 1970); and while utilizing an Army gunner (24 November 1970).

(C) The Phase A program was completed on 16 December 1970 with a total of 69 missile launches of all types being made during testing. Of particular note is the fact that all heat missiles fired for demonstrations and all practice missiles fired by Army gunners hit the target. Hit probabilities achieved were .75 for a minimum range of 500 meters (4 firings and 1 miss); 1.00 at 2000 meters (14 firings and no misses); and .78 at a maximum range of 3000 meters (14 firings and 3 misses).

(U) Development of preproduction hardware [Phase B TOW control equipment (TCE), night vision sight (NVS), increased capacity environmental control system (ICECS), missile installation kit (MIK), and a Phase III swiveling gunner's station (SGS)] was accomplished concurrently with Phase A TOW flight testing. Following completion of Phase A, modifications to the TOW Cheyenne Aircraft 66-8832 were begun to improve its flight characteristics and to facilitate integration of the above mentioned preproduction hardware into it. Meanwhile, an integration test was conducted at General Electric Company to determine how well the SGS/NVS/TOW/laser rangefinder operated in close proximity. Addi-

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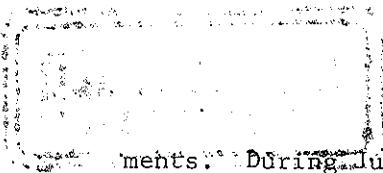
tional subsystems underwent prequalification tests (TCE, NVS, SGS) or full qualification tests (ICECD, MIK). In February 1971, General Electric Company shipped an integrated SGS to Lockheed Aircraft Company who conducted integration tests of their own prior to shipping the station to Yuma.

(U) Several problem areas examined by Lockheed during March and June 1971 included laser interference with TOW and NVS, NVS vignetting, EMI and the sight reticle displaying a running rather than a solid line. The SGS was shipped to Yuma in May and integrated into Cheyenne aircraft 66-8832. First flight of TOW/NVS aircraft with a Phase III integrated SGS was accomplished ahead of schedule on 24 June 1971. Functional checks performed since that date have demonstrated that the SGS and associated TOW, laser, and night vision subsystems were interfacing very well with each other and with the Cheyenne.

Avionics

(U) During Fiscal Year 71, the Doppler Heading Attitude Reference System (DHARS) underwent significant improvement. During June and July of 1970, alignment techniques were perfected with a resultant decrease in both calibration downtime and complexity of support equipment. DHARS shock mounts were upgraded with a resultant significant improvement in vibrational damping, thereby increasing hardware reliability. During Congressional demonstrations in February 1971, DHARS was used in support of fire control system functions.

(U) During the period between January and May 1971, both open and closed course flights were conducted. The results obtained verified navigational accuracies well within procurement specifications require-



ments. During June 1971, the Army accepted the results of the primary mode navigation demonstration flights. These demonstrated results indicated navigation accuracies approaching an order of magnitude better than the procurement specification requirements. Subsequent to the demonstrated accuracy flights, DHARS was used successfully in support of follow-on fire control system demonstrations.

(U) By late June and early July, laser functional capability for determining coordinates of a target by designating the target with respect to a known reference point illuminated by the on-board laser was demonstrated. This same target coordinate design capability by means of the pilot's direct sight was also demonstrated. In addition, the capability for determining the altitude of a target with respect to the altitude of a known position was also demonstrated.

Rotor/Control System

(U) To solve a directional control problem that was discovered early in the development flight test program, a reverse rotation tail rotor was installed on Aircraft 66-8834. This directional control problem was identified as main tail rotor flow interaction, which resulted in the loss of tail rotor thrust of approximately 37%. This loss of tail rotor power resulted in sideward flight to the left being limited to approximately 15 knots at relatively light gross weights. Flight testing proved that the reverse rotation tail rotor provided the tail rotor power required for sideward flight at heavy gross weights. Flight testing progressed through February 1971 with envelope expansion to 188 KEAS @ 18,300 lbs gross weight and sideward flight evaluation to 35 knots both right and left @ 18,000 lbs gross weight being achieved.



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Helmet Sight System Study:

(FOUO) On 23 September 1970, AMCRD directed the AAWS Project Manager, in conjunction with WECOM and in coordination with Combat Developments Command (CDC), to develop detailed program, time and cost estimates for equipping all AH-1G aircraft with helmet sight systems. The program was to be capable of meeting requirements of present AH-1G aircraft as well as the Improved Cobra Armament Program. The Helmet Sight System Study was submitted on 10 November 1970. Two candidate helmet sight systems closely approached the desired characteristics, Honeywell and Sperry-Univac.

Crash Resistant Fuel System

(FOUO) A crash resistant fuel program was approved by the Secretary of the Army on 28 June 1968. The first priority was installation of the system in the UH-1D/H Helicopters. With experience gained from development and production of the UH-1 system, action was taken to develop and qualify a system for the AH-1G. Procurement was initiated with Fiscal Year 70 funding for an initial quantity of 300 units. Modification was to be accomplished at depot overhaul (crash damage) with Army funds.

AH-56A RDT&E (Cheyenne)

(C) The Cheyenne AH-56A RDT&E approved funding program for Fiscal Year 71 was \$34.6 million--\$17.6 million for Army Project D192 Advanced Aerial Fire Support System (Cheyenne), \$9.0 million for D124 Cheyenne Night Vision (Aircraft Weapon Fire Control) and \$8.0 million for D134 TOW/ Cheyenne (Development of Aircraft Missile and Rocket Subsystem). With receipt of the \$34.6 million of Fiscal Year 71 funds, approval was given to initiate the Producibility/Cost Reduction Study with \$1.3 million

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limited to Lockheed and an additional \$0.2 million available for the Stanford Research Institute. Of these amounts \$1.2 million and \$0.2 million was respectfully obligated. At the end of the year, the balance of Fiscal Year 71 funds were frozen pending settlement for the restructured cost reimbursement contract approved by the Deputy Secretary of Defense. Earlier in the fiscal year, \$16.0 million of Fiscal Year 71 funds were released for TOW/Night Vision. Throughout the fiscal year, unobligated Fiscal Year 69 prior year funds were realigned into fragmented parcels of support requirements for AMC Major Subordinate commands. By the end of May 71, the Fiscal Year 69 and prior years Cheyenne program amounted to \$166.6 million and \$164.0 million had been obligated.

AH-56A PEMA (Cheyenne)

(U) Continuation of the Cheyenne procurement program was dependent upon execution of the restructured contract and funding approval for production. No PEMA funds had been programmed for Fiscal Year 71. Such funding for Advance Production Engineering was planned for Fiscal Year 72.

AH-1G RDT&E (Cobra)

(U) Cobra RDT&E funding is presently limited to the Improved Armament Program which calls for \$11.6 million in Fiscal Year 71 and \$10.7 million in Fiscal Year 72. However, by the end of Fiscal Year 71, program approval had not been received pending Congressional action.

AH-1G PEMA (Cobra)

(U) The Fiscal Year 71 PEMA program at year's end was \$38.7 million. All of these funds had been released to the AAWS Project Manager, who

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in turn, made distribution to other AMC commands. Obligations of only \$27.7 million had been accomplished primarily because the majority of the remaining obligations to be made were tied to late release of program. This resulted in late contractual awards for Fiscal Year 71 buys.

AH-1G Highlight of Operations, International Logistics

Distribution and Deployment

(C) During Fiscal Year 71, the world-wide population of AH-1G/TH-1G helicopters decreased from 677 to 594 on 30 June 1971. The decrease was caused by crash and combat losses and a break in the production cycle. These helicopters were distributed as follows:

<u>MODEL</u>	<u>CONUS</u>	<u>USARPAC</u>	<u>USAREUR</u>	<u>IN-TRANSIT MAINTENANCE</u>	<u>TOTAL</u>
AH-1G	80	375	11	93	559
*TH-1G	35				35

(U) During Fiscal Year 71, 192 AH-1G's were deployed to Vietnam from Production/Overhaul, of which 171 were from ARADMAC and Bell Helicopter overhaul programs.

International Logistics

(U) Grant Aid (GA/Foreign Military Sales /FMS/ programs are reflected in the following current planning data:

4 AH-1G	Spain	GA
4 AH-1G	Spain	FMS
11 AH-1G	Australia	FMS (Tentative)

*Modified as trainers by Hunter-Stewart during Fiscal Year 71.

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The US Government has furnished planning data and cost estimates which includes cost for initial support for each program. Action has been completed to procure four AH-1G's with XM-35 provisions for Spain. Delivery was scheduled for August 1972.

AH-56A Logistical Support (Termination of Production Contract)

(U) Under the terms and conditions of the development contract, supply, maintenance and technical support was provided by the contractor for the portions of testing completed during Fiscal Year 71. Inasmuch as the test program did not progress to Phases E and F as originally scheduled, performance of organization and direct support maintenance by Army mechanics did not materialize. Contractor logistical support was provided from central storage and control site at Van Nuys, California, and the units staffed by the contractor at Yuma Proving Ground, Arizona. Termination for default of the Production Contract negated the requirement for the publication of Maintenance and Logistical Support plans. In the event of a production contract, the necessary support plans will be prepared, coordinated and published in accordance with Integrated Logistic support (ILS) procedures.

Chaparral/Vulcan Air Defense System

Background

(U) The Chaparral/Vulcan Air Defense System provides the primary air defense for high value targets in the rear areas. The system is comprised of three elements: Chaparral Missile, Vulcan Gun, and Forward Area Alerting Radar (FAAR). The Chaparral is a "fire and forget" missile system designed primarily for low altitude area defense

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possessing point defense capability. Vulcan is a 20mm Gatling gun providing range point defense against low altitude attack as well as a demonstrated outstanding ground support capability. The FAAR provides early warning to divisional air defense elements concerning the existence of aircraft flying in the division air space.

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(U) The Vulcan Air Defense System was produced in two configurations, the self-propelled (M163) and the Towed (M167). Both were crew served and equipped with a six-barrel, rapid firing, air-cooled, 20mm cannon mounted in a one-man, servo operated turret. The M163 was the M113A1 Armored Personnel Carrier modified to accept the M168 armament system. The M113A1 when thus modified became the XM741. The Towed (M167) system consisted of the M168 system modified and mounted in a tow-wheel carriage pulled by a prime mover. Both systems were electrically operated with selective burst rates. Each system had on-carriage fire control, complete with target ranging devices (Range-Only Radar), computers (sight generator) and optical sights.

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(C) The Army requirement for a low altitude missile to protect air space beneath altitudes of Nike Hercules and Hawk (High and medium altitude missiles) and front line troops and installations against a potential enemy attack led to the emergence of the Chaparral/Vulcan air defense system. Chaparral was a modification of the Navy Sidewinder 1C infrared,

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Fact Sheet, USAMC, Washington, D.C., 1 Mar 72, subject: Project Managed Weapons/Equipment Systems, Brief Descriptions.

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For a chronology of the development of the Vulcan Air Defense System see "Memo History, 1966-1972, Vulcan Air Defense System, USAMC, 1972 in files of Historical Office, HQ, AMC.

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heat seeking missile, adapted for surface-to-air roles. Vulcan was an Army adaption of the 20mm, 6 barrel Gatling gun mounted on a modified armored personnel carrier. In addition to its air defense capabilities, Vulcan was to provide direct fire against ground targets. The combination of both systems were married to provide protection to rear corps and service areas by defeating low level attacking planes approaching along folds of the earth. Chaparral/Vulcan was initiated in 1964 as an interim measure program for defense against low level attack in forward areas of the field army through the mid-1970's.

(C) Then in December 1965, as a result of an air defense study, the Secretary of Defense approved worldwide deployment of 21 composite Chaparral/Vulcan battalions. The Tactical Mid-Range Air Defense Study changed the interim concept into a longer range program that called for many system design changes with corresponding research and development fund increases. Complete redesign of the Chaparral turret, missile, and carriage was necessary to meet worldwide deployment objectives. An improved fire control system, range-only radar, and forward area alerting radar was added to the Vulcan to increase system effectiveness. Activation dates for the battalions was set for October 1968 for Vulcan and January 1969 for Chaparral.

(C) The first Vulcan buy was made in Fiscal Year 1966. Through Fiscal Year 1968, the Army had procured 279 self-propelled Vulcans and

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Challenge-A Compendium of Army Achievement, A Report by the Chief of Staff, Washington, 1 Jul 68, p. 309.

30

Ibid. p. 310.

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102 towed Vulcans. Deliveries of the self-propelled began in November 1967 with first deliveries of the towed version scheduled for November 1968. Regarding Chaparral, through Fiscal Year 1968, the Army had procured 2,325 missiles and 152 fire units and supporting equipment. The first fire unit was delivered in October 1967 and missile deliveries
31
began in March 1968.

(C) In June 1970, ACSFOR set forth an updated activation and deployment schedule for Chaparral/Vulcan for planning purposes. This schedule called for activation of 19 Headquarters and Headquarters Detachment batteries, 27 Vulcan self-propelled batteries, 17 Vulcan towed batteries, and 31 Chaparral batteries. During Fiscal Year 1970, 1,181 Chaparral missiles were delivered bringing the total to date 2,266. Also, during Fiscal Year 1970, 88 self-propelled Vulcans and 87 towed Vulcans were delivered bringing total delivered self-propelled Vulcans to 305 and towed Vulcans to 187. Funding through Fiscal Year 1970 for the Vulcan stood at \$25,702,000 for RDT&E and \$140,562,000 for PEMA. The Chaparral program stood at a total of \$58,291,000 RDT&E and
32
\$244,413,000 for PEMA.

Personnel and Organization*

(U) The Project Manager has the responsibility for definition, development, fielding and support of the Air Defense System comprising

31

Ibid., p. 310-311.

32

(C) Annual Historical Summary, Headquarters, AMC, FY 1970, p. 68-69.

*Material in this and following portions pertaining to Chaparral/Vulcan were taken for the most part from the FY 1971 Historical Summary submitted in September 1971 by the PM-Chaparral/Vulcan Air Defense System.

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the principal weaponry for the Divisional Composite Air Defense Battalion plus other air defense applications. Major materiel items are the self-propelled Chaparral surface to air guided missile system, the self-propelled and towed configuration of the companion Vulcan gun systems and the Forward Area Alerting Radar.

(U) At the beginning of Fiscal Year 71, the manpower authorization for the Project Managers Office was 6 military and 38 civilians. The manpower authorizations for the Assistant Project Manager offices located at USAMICOM for Chaparral and the FAAR, and at USAWECOM for Vulcan were:

	<u>Military</u>	<u>Civilian</u>
APM, USAMICOM	6	61
APM, USAWECOM	2	34

(U) Several reviews of the Chaparral/Vulcan Project Management took place during Fiscal Year 71 with revisions in manpower authorizations and dates for deprojectizing, at Project Manager and the Assistant Project Managers offices. On 30 March 1971, the Project Manager was advised that the project was not being deprojectized, and that the project would continue at least through June 1972. Also, the decision would be reviewed again in January 1972. As of 30 June 71, the APM WECOM office was terminated, and it was understood that the APM MICOM would be phased out by the end of Fiscal Year 72.

System Progress and Status

(C) ACSFOR provided the latest Chaparral/Vulcan Activation/Deployment schedule for planning purposes in February 1971. The schedule plans for activation of 19 HQ and HQ Detachment batteries, 27 Vulcan

(SP) batteries, 17 Vulcan (Towed) batteries, and 31 Chapparral batteries.

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As of 30 June 1971, 21 VULCAN SP batteries had been activated and 16 deployed; 11 Vulcan Towed batteries activated and 7 deployed; and 23 Chaparral batteries activated with 19 deployed.

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Chaparral Air Defense System Procurement

(C) A contract was let by USAMICOM in the amount of \$1.8M to Aero-neutronic Division of Philco-Ford for the Fiscal Year 71 procurement of Chaparral Weapon System Test Equipment consisting of:

- 24 each AN/TSM-85 Test Support GM System
- 2 each AN/TSM-101 Test Set GM System
- 3 each AN/TSM-96 Support Maintenance Test Set
- 8 each AN/TSM-95 Organizational Maintenance Test Set
- 11 each M71 Alignment Set Launcher

There was no Fiscal Year 71 Procurement Buy of Fire Units. Components for the Chaparral missiles are procured from Navy by Military Inter-departmental Purchase Request (MIPR). The Fiscal Year 71 PEMA procurement was for a quantity of 2000 missiles with an option for 1000 missiles. The first production contract for Simulator Evaluators (118) was awarded to Hydro Systems Inc. in the amount of \$448,000.

Chaparral Missiles and Chaparral Ground Equipment Deliveries

(C) There were 2318 missiles delivered in Fiscal Year 71, making a cumulative total of 4600 missiles delivered thru Fiscal Year 71. Of this total 3057 were tactical missiles and 1543 were training missiles. Chaparral Ground Equipment Fire Units delivered in Fiscal Year 71 amounted to 148 units, cumulative production thru Fiscal Year 71 amounts to 444 fire units. Total requirement of 448 Fire Units was completed in July 1971.

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(C) Message, DA 082318Z from ACSFOR-AD to AMC, Feb 71, Subject: Chaparral Activation Deployment Schedule for Planning Purposes.

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Evaluation of Results of Chaparral Firings

(C) The success rate, which takes into account all missile firings of the entire series updated thru Fiscal Year 71, is 83.92 percent based on 902 valid firings:

<u>Series</u>	<u>Fired</u>	<u>No. Tested</u>	<u>Fail</u>	<u>Not Scored</u>	<u>Misfire</u>	<u>Success</u>	<u>% Success</u>
CONARC	966	40	145	7	25	749	83.78
Comparison Test	<u>8</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>8</u>	<u>100.00</u>
TOTAL	974	40	145	7	25	757	83.92

Targets Utilized: MQM-34D, MQM-61A, TOWBEE, R-CAT and BATS (17 CONARC Shots) CONARC firings were not instrumented and the results were based on visual scoring estimates by an observer.

Chaparral Improvement Program

(C) Product improvement programs have been approved (June 1970) for a directional doppler (DIDO) fuze and blast fragmentation warhead, to improve warhead burst control, improve counter-measures capability, and provide improved lethality. Programs have been submitted to DA for approval for a solid state, all aspect guidance and control (GCG) unit to provide target forward hemisphere attack capability and improved inner boundary capability; an active optical (AO) fuze for warhead burst control; and a target acquisition aid (TAA), to assist the gunner in the acquisition of targets, particularly during periods of reduced visibility. Additional programs are under study prior to submission to DA for approval for a smokeless rocket motor to reduce weapon signature, a remote acquisition and automatic tracking device, a lightweight towed fire unit, a target ranging device, and a target identification device. All these programs are aimed at improving

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system effectiveness. As of 30 June 1971 funds released for Chaparral program are: RDT&E \$58.839M, PEMA \$293.578M.

Vulcan Air Defense System Procurement

(C) A procurement contract was awarded by Frankford Arsenal to Polarad Electronics Corporation in the amount of \$344,000 for the Fiscal Year 71 procurement of Organizational Maintenance Sets, AN/TPM-23 (67 each). A contract was awarded GE for a quantity of 48 Vulcan Systems (Towed) for a Grant Aid Buy with delivery July thru December 1972. There were 78 Vulcan Systems (TOWED) delivered in Fiscal Year 71, making a cumulative total of 201. Total requirement of 222 Towed Systems is planned for completion in September 1971. There were 75 Vulcan Systems (SP) delivered in Fiscal Year 71, making a cumulative total of 381 delivered, and completes total requirement for the Self-Propelled Systems.

Evaluation of Vulcan Product Improvement - Gun Air Defense Effectiveness Study (GADES)

(C) The immediate goal of the GADES program was to provide a quantification of current Vulcan Air Defense System effectiveness, the need for system improvements, the cost effectiveness and increase in system effectiveness associated with each potential system improvement, and as a basis for decisions concerning the future of Low Altitude Forward Area Air Defense System (LOFAADS) gun systems. The GADES program involved development of seven models to accomplish specified objectives as: cost, reliability, engineering, fire unit effectiveness, fire unit vulnerability, fire unit ground role, and a systems effectiveness/cost effectiveness model. The Final GADES Report (last Phase II Milestone) was scheduled for 1 December 1972.

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(C) Several product improvements were under consideration prior to submittal to DA for approval. However, no decision as to submittal to DA was to be made prior to evaluation by GADES for cost effectiveness. Items being considered were an improved servo system to improve smooth tracking rate capability; an improved turret control system to aid the gunner in tracking; an automatic tracing device; improved ammunition with decreased time of flight to reduce the fire control problem; a target acquisition aid (TAA) to assist the gunner to acquire target, particularly in period of reduced visibility, an improved range and range rate device, and a target identification device. As of 30 June 1971 funds released for the Vulcan program were: RDT&E \$27.182M, PEMA \$139.935M.

Forward Area Alerting Radar (FAAR)

(C) Efforts to reinstate the FAAR production program dominated the first nine months of Fiscal Year 71. The adequacy of the alerting capability of the antenna was under scrutiny. A FAAR Program Review consisting of General Officers representing ACSFOR, DCSLOG, OCRD, CDC, CONARC, and AMC was held by the Commanding General, AMC on 25 March 1971, to decide if the FAAR, as currently designed, was suitable for Army use. Following this review the decision was made by the CG, AMC to proceed with production. The contract modification was signed by the Army Contracting Officer and Sanders Associates, Inc. on 2 April 1971, authorizing a go-ahead on the production contract for 90 radars, with the first radar scheduled for delivery in November 1971. This rescinded

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Stop Work Order placed on the Sanders production contract in July 1969.

(C) Because of the relatively high cost of delaying production, the decision was made to resume production of the FAAR on a slow schedule whereby early deliveries would be cut in half and the number of personnel and procurement of material held to an absolute minimum by the contractor. The additional costs incurred by this stretchout were \$895,000, plus a profit of 10.75%. As of 30 June 1971, funds released for the Program are: RDT&E \$8,713M, PEMA 41.001M.

Problems

The Major Problem Areas as of 30 June 1971 were:

Chaparral System Effectiveness

(U) Chaparral was type classified Std A with the understanding that specific action would continue to meet the system effectiveness requirements of the QMR. Product improvements discussed above were designed to improve the system effectiveness to meet the requirements of the QMR.

Vulcan System Effectiveness

(U) The Vulcan System failed to meet the effectiveness requirements of the QMR, principally in the areas of accuracy and smooth tracking rate. Efforts to improve effectiveness were frustrated because of the inability of the Army to adequately define effectiveness, and from that definition, determine what the actual effectiveness was and what effectiveness was really required. The GADES effort, described above was designed to provide the Army this evaluation capability, and also the capability to meaningfully evaluate the cost effectiveness of

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(C) Management Review, Deputy Director Research and Engineering,
Subject: Main Battle Tank, ~~20 Oct 70~~.

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various possible modifications.

Main Battle Tank (XM803)

Introduction

(U) Main Battle Tank was a fully tracted armored combat vehicle that was scheduled to replace the older M48A3 and M60 series tanks. The vehicle mounted a 152mm Shillelagh missile. It was powered by a 1,250 horsepower compression ignition engine used in conjunction with a hydromechanical transmission, and capable of road speeds of 40 miles per hour. The XM803 called for a three man crew, an automatic loader and an improved night vision capability. The hydropneumatic suspension system permitted increased off-road mobility and in conjunction with the stabilization system delivery of accurate fire while in motion over rough terrain.

(C) In January 1970, the Secretary of Defense directed that the former relationship with Germany in the joint development of a main battle tank be changed. The program agreed to in a Memorandum of Understanding with Germany called for joint continuation of the program under a policy of maximum commonality consistent with national interests. with the stipulation that each country have complete freedom to make unilateral technical decisions considered necessary to meet individual requirements. It was also agreed to discontinue joint funding provisions. The reorganization allowed the Project Manager, MBT, to place a greater share of developmental responsibility on the US prime contractor, General Motors, who was responsible for all components in the

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tank, including interface with government furnished equipment and
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including components originally designed by the Germans.

(U) During Fiscal Year 1971, Brigadier General B. R. Luczak, USA Retired, continued as United States Program/Project Manager, MBT, during Fiscal Year 1971. On 25 February 1971, the designation of the MBT-70/XM803 tank was changed to Main Battle Tank XM803 (MBT XM803). A decision on a name designation for MBT XM803 has been deferred until production. The information contained in this historical summary follows an activities arrangement and will cover the following general areas: High level reviews, Organization, International Activities, Technical and test activities, Procurement and production, Financial, Special Studies and projects, and Heavy Equipment Transporter.

High Level Reviews

(FOUO) As a follow on to a design review on 13 May 1970, another design review was presented to the Assistant Secretary of the Army (Research and Development) on 1 July 1970. It consisted primarily of a review of the Request for Quotation (RFQ) to be issued to the General Motors Corporation, the prime contractor for MBT XM803, and action items resulting from the 13 May 1970 review.

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(C)Management Review, Deputy Director Research and Engineering
Subject: Main Battle Tank, 30 Oct 70.

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(FOUO) Shortly after the beginning of Fiscal Year 71, the Secretary of the Army was obligated to inform the Deputy Secretary of Defense of actions taken in the MBT XM803 program since the DEPSECDEF review of the program in December 1969. Therefore, a status review of the program was presented to the Secretary of the Army on 15 July 1970. Items covered included the decision to fabricate the second generation pilots in the Detroit Tank Plant and the decision that production planning should be on the basis of production at the same location. This recognized that a production decision would not be made for some time.

(FOUO) On 21 September 1970, the Commanding General, Army Materiel Command, reviewed the status of the MBT XM803 Program. The review covered Congressional action, preparation of a revised draft development Concept Paper, and visits to General Motors Corporation by the Deputy Commanding General, AMC, and by ASA (I&L) and ASA (R&D), in connection with GM's management of the program and their delay in submitting a response to the RFQ.

(FOUO) In the course of his continuing review of the management of Department of Defense research and development programs, Dr. John S. Foster, Director, Defense Research and Engineering, made an in-depth review of the MBT XM803 Program on 20 October 1970, covering program management structure and practices. During the review, Dr. Foster probed at some length into the Government as well as the General Motors management organizations, and questioned the number of personnel assigned to the Office of the Project Manager, MBT. He accepted the suggestion of the Project Manager, MBT, that a detailed review of the personnel requirements for the Office of the Project Manager, MBT,

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would be more appropriate following definition of Government/contractor relationships and after the contractor and Government personnel were physically relocated to the Detroit area.

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(FOUO) In April 1971, the Project Manager, MBT, was advised that a briefing on the Army Tank Program had been requested by the Special Subcommittee on Close Support (Cannon Committee) of the Senate Armed Services Committee. Senator Cannon and his staff questioned Department of Army representatives and the Project Manager, MBT, at great length on a variety of subjects, such as escalation factors used in the costs, the changes in the international agreement with Germany, and the rationale for the Army tank requirements in the future. Those answers which could not be provided during the hearing were forwarded to the Committee for inclusion in the hearing record.

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(FOUO) The first quarterly Review and Command Assessment Program (RECAP) on MBT XM803 was presented to the Commanding General, AMC, in June 1971. During the review, major emphasis was placed on the XM578 kinetic energy round, transmission, changes in the vehicle configuration and the Congressional actions which could drastically change the program funding. Also covered were the status of contract negotiations with General Motors and their use of Cost/Schedule Control System Criteria under the proposed contract.

Organization

(FOUO) During his review of the MBT XM803 Program in March 1970,

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(C) Ibid.

37

(FOUO) Army Tank Program Briefing, XM803, Department of Army to Special Subcommittee on Close Air Support, Senate Armed Services Committee, 21 Apr 71.

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the Commanding General, AMC, directed the Office of the Project Manager, MBT, to relocate to the Detroit area. This relocation required a new organization, combining the functions and responsibilities of the MBT Washington office with those of the MBT Engineering Agency already in the Detroit area. Additionally, the new organization was required to accommodate a reduction in total personnel authorization from 174 to 120. A new Table of Distribution and Allowances was prepared and submitted to AMC. It was approved by AMC and DA with an effective date of 25 June 1971.

(FOUO) When the transfer of functions to Detroit was announced in April 1970, the MBT Washington office was manned by a total of 57 persons, including 15 officers, 2 enlisted men and 40 civilians. Of the civilians, only three, one of which was the Project Manager, indicated a willingness to transfer to Detroit to accompany their functions. At the end of Fiscal Year 71, the strength of the MBT Washington Office had been reduced to 5 officers, 2 enlisted men and 18 civilians, a total of 25. Further reductions are scheduled during Fiscal Year 72 in order to bring the personnel strength within the authorized level. In the meantime, the staff of the Office of the Project Manager, MBT, Warren, Michigan, was being augmented to accommodate the transfer of functions and responsibilities from the Washington office. This transfer started early in the calendar year 1971 and by 30 June 1971 was approximately 75 percent complete. There were no changes in the international organization during Fiscal Year 71.

International Activities

(FOUO) Following the January 1970 reorientation of the Program

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toward a cooperative rather than a joint effort, and following the establishment of the Technical Coordination Group in May 1970, the exchange of information between the two countries, United States and Federal Republic of Germany (FRG) proceeded at a satisfactory pace. Each country received information on testing of components and pilots in the other country. Industry representatives of both countries continued to support the test activities conducted in either the US or the FRG.

(C) In January 1971, the Program Coordination Board held its first meeting. The Board was established in May 1970. During the meeting, the two Program Managers exchanged information on their national tank programs. For example, the German Program Manager outlined the German program for incorporating in their Leopard I Tank a number of components developed under the MBT-70 Program. This new vehicle is presently being planned in two versions, a gun tank (Leopard II-K) and a missile firing tank (Leopard II-FK).

(C) In view of the expressed intent of the FRG to use the Shillelagh missile system if it builds a missile firing tank, efforts by the US Government were intensified to provide the FRG with a complete license package at the best possible terms and conditions. A number of meetings were held between US and FRG Government, as well as between representatives of the US Government, the Shillelagh prime contractor (Philco Ford Corporation), and major sub-contractors. However, after a thorough review of the various license proposals, the FRG decided in late Spring 1971 that in the event the Shillelagh missile system is utilized in their missile firing tank, the weapon

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system would be procured from the US rather than fabricated in the FRG. Final decision on this matter, however, was not anticipated in the near future, due to the budgetary restraints in the FRG.

(U) Technical and Testing Activities

(FOUO) Engine/Transmission. Three contractor-conducted 400 hour NATO type tests were completed on two 1250 GHP AVCR 1100-3B engines. A formal 400 hour NATO type durability test, under the supervision of General Motors was initiated by Teledyne Continental Motors on 23 February 1971 and completed on 18 March 1971. Only minor incidents were experienced. 3481 dynamometer hours and 894 vehicle miles have been accumulated with the present engine configuration. Effort on the engine concentrated on optimizing components and improving engine low-end performance for a better match with the transmission. Approximately 370 hours of laboratory tests and 1900 miles of vehicle tests had been accumulated on the XHM-1500-2B transmissions. In addition, accelerated durability tests were conducted on the transmission hydrostatic units. Dynamometer durability testing of the engine and transmission was initiated on an automatic tape cycle simulating vehicle conditions.

(C) 152mm Ammunition. Two incidents of metal parts break-up in the gun tube were experienced in July 1970 during the final phases of the kinetic energy round final engineering design (FED) series of firings. The FED series of tests were suspended and static and dynamic tests were initiated to isolate the problem. At the same time, two back-up designs were initiated. The test results showed that the major cause of failure was propellant gas leakage between the components, causing

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sabots to separate from the sub-projectile during travel in the bore. Based on the data received during the tests, design changes were incorporated to overcome these problems. To date, over 100 rounds have been fired without a similar metal parts failure. Based on the firing tests to date, consideration is now being given to stopping additional work on the back-up designs and concentrating only on the primary design. A decision was expected early in Fiscal Year 72.

(FOUO) 152mm Gun/Launcher, XM150. Early in Fiscal Year 71, the R&D bore scavenger system was undergoing final development tests at Aberdeen Proving Ground. The tests showed that the scavenger level of performance required improvement. Since that time, the system design was successfully modified, retested, and incorporated into the second generation cannon design by Watervliet Arsenal. Procurement of the initial group of second generation design cannon for engineering and service testing was initiated in April 1971.

(FOUO) Fire Control. One of the most significant design changes proposed in the Producibility/Cost Reduction Study was to combine the commander's day sight and night sight into a single unit, the design of which had been completed. The sight also incorporated the secondary weapon system, and test firings eliminated the concern that firing the secondary weapon might have an unacceptably adverse effect on sight stabilization. Additional tests were still being performed. A breadboard driver's night vision device had been fabricated and was being tested. Performance was considered excellent. The gunner's primary sight had been designed and a breadboard fabricated. In addition, a computer study and laboratory evaluation had been completed to confirm

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that there were no interface problems between the missile system and the gunner's primary sight laser.

(FOUO) Pilot 5 was subjected to vulnerability shock tests as generated by projectiles and mines to determine the shock effect on fire control mechanisms and stowed ammunition. These tests included three turret shots with a 105mm round, one impacting the left front of the turret, one the right front of the turret and the third on the gun shield. The pilot was then subjected to two mine detonations, one under the left track and one under the belly of the tank. The pilot was also subjected to five overhead 155mm blasts. These tests were conducted primarily to determine the shock experienced by equipment and personnel inside the tank. Extensive data were recorded for evaluation.

(FOUO) In addition to the tests on Pilot 5, simulated bustles were loaded with XM411/XM409 rounds and subjected to flank attack by HEAT rounds of the infantry-carried type. This assisted in determining the impact on firepower and mobility of such an attack. The results have been encouraging and various design improvements are being studied. Simulated tank nose sections were also fired upon, using the 105mm HEAT round. Hull design improvements have been made and the test data indicates improved protection for both stowed ammunition and the tank crew.

(FOUO) Pilot Demonstrations. On 25 June 1971, Pilot 2 provided a dynamic mobility/firepower demonstration for attendees at the Joint Logistics Commanders Conference held at Aberdeen Proving Ground, including the Deputy Secretary of Defense, the Director of Defense Research and Engineering, the Assistant Secretary of Defense (Installations

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and Logistics), and the Assistant Secretary of the Army (Research and Development). The firepower demonstration consisted of firing an XM578 kinetic energy round from Pilot 2 while moving over rough terrain at a speed of 15 miles per hour. The target was stationary at a distance of over 1000 meters. Results were excellent. In addition, the attendees were afforded an opportunity to inspect a static display, including the automatic loader and 152mm ammunition models, and to see the results of the vulnerability testing of Pilot 5.

Limitations of MBT

(C) On 19 August 1971, Dr. Foster, Defense Director of Research and Engineering viewed a series of film clips taken of vulnerability tests made on the MBT. After viewing the film Dr. Foster asked for statistical data regarding attacks against the MBT. He was told that defense coverage against small heat rounds was good and that protection against air attack with 20 or 30mm ammo would not be a problem but that protection against missiles the size of TOW or Shillelagh was a problem. It also came out upon questioning by Dr. Foster that a shaped charge could penetrate the floor of the tank and cause crew damage which could be reduced with more armor under crew seats. The additional weight
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would effect range acceleration and mobility, however.

(FOUO) Dr. Foster's queries about the turbine program and the possibility of using the turbine engine in the MBT brought the response that although the turbine was considered the ultimate power for a tank,

38

(C) MFR, BG B. R. Luczak, Project Manager, Main Battle Tank (XM-803), 20 Aug 73, subject: Meeting With Director, Defense Research and Engineering, AMCPM-MBT.

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it was not then being considered for the MBT XM803 because of its high acquisition cost. Even with lower maintenance costs which were most desirable during the current period of manpower reduction, the break-even point would be in the 1985 time frame.

Procurement and Production

(FOUO) At the beginning of Fiscal Year 71, there were 22 active contracts for MBT XM803. During the year, 9 additional contracts were awarded and 11 completed, leaving a total of 20 active contracts at the end of Fiscal Year 71. There were two active contracts for the Heavy Equipment Transporter (HET).

(FOUO) During the first week of August 1970, an RFQ was forwarded to General Motors, calling for research, development, advance production engineering and other effort through completion of engineering and service tests of the ten pilot vehicles to be fabricated under the contract. General Motors response to the RFQ was complicated by the fact that no decision had been made on the location for fabrication of the pilots. The decision was made by the Commanding General, AMC, and approved by the Secretary of the Army in October 1970 to fabricate the pilots in a portion of Building 4, TACOM, which was not being used for M60 production. In November 1970, General Motors responded to the RFQ with a quotation which was some \$100 million in excess of the independent Government cost estimate. At the same time, General Motors submitted an informal proposal calling for a program with four pilots instead of ten, a reduction in software and reporting to the Government, performance of

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most of the engineering tests by the contractor, and a production decision prior to initiation of the service tests. Maintenance of the vehicles and supply of spare parts would be handled by GM through the first two years of production, thus making competition impossible for the first several buys. The first six tanks out of the production run would be used for operational service tests.

(FOUO) Following initial examination of the proposal, GM was notified that the proposal was unacceptable to the Army as presented; however, with an increase in the number of pilots to six with the cost taken out of other items in the proposal, and with a change in the provisions for engineering tests, the proposal would be briefed through the Commanding General, AMC, to Department of Army to determine its acceptability. In December 1970, the Commanding General, AMC, following a conference with the Assistant Secretary of the Army (Installations and Logistics) and the Assistant Secretary of the Army (Research and Development), authorized a performance type contract with GM, based on the informal proposal, but covering only the period from 1 January through 30 June 1971. This interim contract would permit effort to continue and would provide time to negotiate the contract for the completion of the program.

(FOUO) When it became evident, because of adverse Congressional action on the Fiscal Year 72 Appropriation for MBT, that the funds to become available to MBT during Fiscal Year 72 would be sharply reduced, the six month interim contract was extended to the end of October 1971 on a greatly reduced scale of effort.

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MBT Development

(FOUO) On 29 December 1970 the Tank-Automotive Command awarded a letter contract to General Motors for Main Battle Tank work during the period 1 January to 30 June 1971. This first six months effort was intended as the first increment of a 42-month program expected to complete development. It was expected that the remaining 36-month development phase would be contract awarded following receipt of cost proposal⁴⁰ from the contractor no later than 25 June 1971.

MBT-70 (Program in Trouble)

(U) In its deliberations regarding the Fiscal Year 1971 appropriations for further research and development and advance production planning for the MBT-70, the Senate Armed Services Committee under Chairman Stennis noted that it was aware of problems regarding the project. The committee found that the tank would be delivered more than a half decade late, provide less capability than promised, cost at least 2½ times original estimates and would face threats that were now substantially upgraded. The committee pointed out that though \$77 million had been earmarked to continue the program that the funds did not commit the tank to production. The committee indicated further review of costs and reliability factors would guide future obligations⁴¹ which it was hoped would not reflect past performance.

⁴⁰

(FOUO) Ltr, AMCDMA, CG AMC, Gen. H. A. Miley to Hon. J. Ronald Fox, Asst. Sec. Army, 1 Feb 71 (no indicated subject)

⁴¹

Congressional Record - Senate, ps 14534, August 28, 1970.

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(FOUO) Concurrent with negotiations with General Motors for the development program, the process of determining what equipment would be moved from the Cleveland Army Tank-Automotive Plant to Detroit was performed. In April 1971, the facility contract was signed with General Motors for renovation and installation of equipment in Building 4 at TACOM. Although no decision had been made at the end of the fiscal year as to what personnel or how many would be relocated to Detroit, the goal for completion of the relocation remained 30 September 1971.

(FOUO) During the same period, a study was performed to investigate the phase-in of MBT XM803 production into building 4, TACOM. The recommendation resulting from the study was that the MBT XM803 production contractor should be given Building 4 as is after the final M60A1 production, to adapt it to MBT XM803 production within the production break guidelines established by the Commanding General, AMC. No decision had been made at the end of the fiscal year.

Financial

(FOUO) For Fiscal Year 71, MBT XM803 was authorized \$36.0 million RDT&E, including \$32.9 million for tank development, \$2.5 million for program support such as salaries, travel and operation of the Project Manager's office, \$0.4 million for advanced component development and \$0.2 million for the Heavy Equipment Transporter. The program was also authorized \$41.0 million in PEMA-APE funds for MBT XM803, plus \$1.9 million for the HET.

(FOUO) In December 1970, during the Department of Defense consideration of recommendations for the President's Budget for Fiscal Year 72, a Program Budget Decision recommended elimination of all APE funds

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for MBT XM803. Following reclama by the Project Manager and DA Staff, funds were reinstated. As submitted to Congress, the President's Budget for Fiscal Year 72 called for \$27.5 million RDT&E and \$59.1 million PEMA-APE funds.

(C) In May 1971, the House Armed Services Committee deleted all APE funds from the MBT XM803 Program, but retained the \$27.5 million RDT&E. On 28 May 1971, in a letter to Senator Stennis, the Chairman of the Senate Armed Services Committee, the Deputy Secretary of Defense recommended that the Fiscal Year 72 APE funds of \$59.1 million be transferred to the RDT&E appropriation for a total RDT&E funding of \$86.6 million for Fiscal Year 72 to continue the development effort of XM803 without a commitment to procurement. The Senate Armed Forces Committee had not acted on this matter at the end of Fiscal Year 71.

(C) A revised draft Development Concept Paper for a program total of \$342.5 million RDT&E element and \$273.1 million PEMA base production was approved by the Assistant Secretary of the Army (Research and Development) and forwarded to the Director, Defense Research and Engineering on 29 July 1970. The DCP was staffed in ODDR&E from July through December 1970, and then was held without action pending firm General Motors cost data for contract negotiations. In view of the adverse action by the House Armed Services Committee, and since the Senate Armed Services Committee has not acted on the Fiscal Year 72 budget for MBT XM803, no further action was taken on the DCP during Fiscal Year 71.

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Special Studies and Projects

(U) In response to the requirement that a risk analysis study be performed on MBT XM803, a proposal was received in December 1970 from Battelle Memorial Institute for such a study. Following the approval by the Chief, Research and Development, DA, a contract was signed on 14 May 1971 with Battelle Memorial Institute to perform a risk analysis of MBT XM803, covering schedule, cost, and performance of the overall system as well as several individual components. Completion of the study was expected in Fiscal Year 72.

(FOUO) A Producibility/Cost Reduction Study was accomplished under the direction of the Project Manager, MBT, and involved separate contracts with Battelle Memorial Institute, General Motors Corporation, and Lockheed Missiles and Space Company. Phase I of the study was completed in November 1968 and Phase II ended on 1 December 1969. The vehicle analyses and comparisons as well as comparisons of procurement alternatives and production bases resulting from the study, were utilized to reduce anticipated vehicle production costs and program acquisition costs. The study had been continuously updated since completion of Phase II to identify significant cost changes and impact of engineering developments. The latest update, Phase III, was scheduled for publication at the beginning of Fiscal Year 72.

(FOUO) MBT Cost Estimates were based on a study directive approved in May 1971, and the MBT cost estimate was updated. The areas being addressed

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included production cost, R&D, APE, production base support, initial provisioning ammunition, and maintenance of production base support. Results were scheduled to be published early in Fiscal Year 72.

(FOUO) An Audit Trail based on a 1 March 1971 letter from AMC Comptroller on the subject of Cost Trail of Baseline Cost Estimates for Major Weapon Systems was prepared by MBT that attempted to track those supportable life cycle cost estimates, starting with the 1967 Army study and ending with the latest update of the Producibility/Cost Reduction Study.

(U) A revised System Development Plan for the unilateral MBT XM803 was drafted by MBT. It was staffed within AMC, Combat Developments Command and Continental Army Command by means of a correspondence In-Process Review. The revised plan was submitted to DA in February 1971, and was pending action at the end of the fiscal year.

(U) In September 1970, a conference was held with representatives of commodity commands, Army Maintenance Board, Combat Developments Command, and other interested Government agencies to provide information on the logistical support of MBT XM803 through the development, production, and deployment phases, and to set up an Integrated Logistics Support team for the MBT XM803 development. Discussion areas included repair parts, special tools and test equipment, provisioning, maintainability, training, publications, implementation of a modified Maintenance Engineering

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Analysis Data System, commodity command responsibilities and key program milestones.

(FOUO) MBT XM803 Mock-up Review was conducted during February 1971. This was an informal review and maintenance evaluation of the XM803 preliminary vehicle mock-up conducted by logistical support personnel from commodity commands and other interested agencies. From this evaluation, 49 design recommendations were generated in the areas of maintainability and crew efficiency. These were being considered for incorporation into the MBT XM803 configuration.

(U) The HET, a responsibility of the Project Manager, MBT, consists of a 22½ ton truck-tractor (XM746), and a 60 ton semi-trailer (M747). Because of deficiencies that were reported during the engineering and service tests, it was determined that the XM746 would be rebuilt and submitted for check tests early in Fiscal Year 72. Two rebuilt truck-tractors were fabricated and readied for delivery to the Army in July 1971. The M747 semi-trailers satisfactorily completed testing and the M747 was classified Standard A in December 1970. The 200 trailers procured on LP action were fielded worldwide. On 1 January 1971, management responsibility for the semi-trailer, M747, was transferred from Project Manager, MBT, to Commanding General, US Army Tank-Automotive Command.

XM803 MBT - Terminated

(U) On 14 December 1971, a Senate-House Conference Committee terminated the XM803 Main Battle Tank. The conference committee

provided \$40,000,000 - half of which was for termination costs. The other half was for prototype development of two new tanks. Prior to killing the XM803 program, Congress and the Army long debated the issue. The Senate committee had been advised by staff investigators that the XM803 would cost about \$1,000,000 each compared with approximately \$300,000 for the currently used M60A1 tank.

(U) The House committee, prior to the conference, had been very critical indicating that the MBT was unnecessarily complex, excessively sophisticated and much too expensive. The House committee felt that minor Army modifications of the tank had not sufficiently met cost effective recommendations required by the committee in its Fiscal Year 70 appropriations bill. In its 1970 report, the committee indicated that it was highly doubtful that the US could devote the resources needed to acquire sufficient numbers of the MBT-70/XM803 to meet a Soviet threat at the high cost per tank.

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Joseph B. Hayes "A New Main Battle Tank?" Tank-Automotive News, March-April 1972, p. 47.

CHAPTER III
PROJECT MANAGEMENT

PART II - SUPPORT PROJECTS AND EQUIPMENT

CONTAINER SYSTEMS

Background Organization and Mission

(U) The Joint Logistics Review Board, authorized by the President, completed its findings in 1970. It was tasked to study the worldwide logistics support provided during the Vietnam era (1965 to 1969). One recommendation was to fully exploit the advantages of containerization by establishing project managers for container-oriented logistics systems (Army-Land/Water/Land and Air Force-Land/Air/Land). Accordingly, the CG AMC directed that a Product Manager be established at HQ AMC as an interim measure pending establishment of a Project Manager with tri-service participation. Per AMC Message DTG 231819Z Sep 70, the Product Manager was established effective 21 September 1970. A charter approved by the CG AMC, 21 Oct 70, formalized the office and defined its scope of management responsibility for program execution and resource allocation. General Chesarek, CG, AMC, named Colonel Raymond A. Cramer as the Product Manager.

(U) The Office, Product Manager - Container Systems included a Logistical Management Division, a Technical Management Division, a Program Management Division and a Field Office for the Logistics Control Office, Pacific. An aggregate total of 5 military and 26

civilian personnel was authorized.

(U) The Department of the Army was designated as the Executive Service for the Surface Container-Supported Distribution Systems Development Project. The project was to develop standard equipment, policies and procedures that could be used by all the military services and DSA to exploit the full potential of surface container-supported distribution systems. This includes the planning, directing and controlling of resources authorized for the execution of approved projects. The major project responsibilities were: (1) satisfying and reporting specific development and support requirements of the participating Services/Agencies; (2) the development of necessary Joint Operating Procedures (JOPS) which will specify the procedures for satisfying peculiar requirements of the participating Services/Agencies; (3) providing optimum commonalty and interchangeability of systems equipment and procedures throughout DOD; and (4) insuring compatibility of the DOD Surface Container-Supported Distribution Systems with those elements of the commercial industry with which they must interface.

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(U) The Table of Distribution and Allowances (TDA) for the Office of the Product Manager, Container Systems was approved 13 January 1971 effective 15 January 1971. Most of the personnel authorized were on

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(1) Message, AMC, 19 Sep 70, subject: Establishment of Project Manager for Container Systems (2) Product Charter for Container Systems, USAMC, 22 Oct 70 (3) Manning Chart, Product Manager - Container Systems, 21 Jun 71.

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Fact Sheet, US Army Materiel Command, "Project Managed Weapons/Equipment Systems" Washington, DC, 1 Mar 72.

board as of the end of Fiscal Year 71. The DOD Charter for all the Services (see Figure 1) (Army-Navy-Air Force) was approved on 25 June 1971 for the Project Manager, Surface Container-Supported Distribution Systems Development.⁴⁵

Operations

MILVAN

(U) Interim MILVAN operating procedures were distributed to the field in January 1971 and were being tested in MILVAN Pilot Operations. When fully tested and accepted, these interim procedures were to serve as the basis for joint operating procedures.

(U) The MILVAN Pilot Operations started in May 1970 by Directorate of Distribution and Transportation, HQ USAMC, and continued by the PM-CS. General cargo was being moved under this operation using leased and Army owned 8x8x20 ft containers. Cargo was being moved from seven West Coast depots to Southeast Asia as well as intra and inter-theater movements between Thailand, Vietnam and Okinawa. The pilot operations were to be analyzed in terms of cost, time, engineering and performance factors.

Test of Containerized Shipments of Ammunition (TOCSA)

(U) A "Test of Containerized Shipments of Ammunition" (Operation TOCSA) was authorized by a DOD Directive of August 1969 tasking the Army and Navy jointly to determine the feasibility of containerizing ammunition as a means of increasing the capability of our ammunition

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(1) TDA, USAMC Office of Project Managers, 11 Dec 70 (2) Project Manager Charter, Surface Container-Supported Distribution Systems Development Project, 25 Jun 71.

ports in the event of a major emergency. The Commanding General, USAMC was tasked to act as principal Department of the Army executive agent in conducting the test.

(U) For the test, 226 container loads of ammunition were transported via Cam Ranh Bay, Vietnam, direct to base depots and users at inland ports. The ammunition came from four CONUS plants and one depot; specifically: Indiana Army Ammunition Plant, Charleston, Indiana; the Iowa Army Ammunition Plant, Burlington, Iowa, the Lone Star Army Ammunition Plant, Texarkana, Texas; the Louisiana Army Ammunition Plant, Shreveport, Louisiana; and the Sierra Army Depot, Herlong, California. The containers were transported over the road to the Naval Weapons Station, Concord, California, there they were loaded aboard the SS "Azalea City" for the voyage to Cam Ranh Bay.

(U) Upon arrival in Vietnam, 44 containers on chassis were transhipped to Qui Nhon, the containers were further distributed by convoy to inland ASPs to Pleiku, An Khê, and Landing Zone English where the containers were unstuffed in less than one hour each.

(U) Results of this first test showed that the use of van size containers to transport ammunition provides for a greater degree of efficiency in terminal loading and unloading, ship turn around, work force utilization, and overall port capabilities. Results also showed a great potential for shortening pipeline time and further reducing costs when compared to the traditional breakbulk methods. One of the outstanding benefits derived from the test was the improved condition of cargo upon delivery at final destination.

(U) Operation TOCSA also revealed certain shortcomings that will require resolution before the full benefits of containerization for movement of ammunition can be realized. The major disadvantages highlighted by the test stemmed from the type of container used and the method employed to block and brace the contents. Additionally, present pallet load dimensions did not permit efficient weight and cube use of containers.

(U) USAMC Ammunition Center, Savanna Army Depot, Illinois conducted tests to insure structural soundness of containers and to develop proper methods of securing the ammunition in the container. Only with the complete cooperation afforded by the US Coast Guard and their approval of this heretofore untried method of transporting ammunition was USAMC able to proceed with Operation TOCSA. The approved procedures, however, required large amounts of dunnage for blocking and bracing to restrain the movement of palletized ammunition within the container. This was costly in terms of materiel resources and time consumed. Corrective actions were taken by USAMC to correct such deficiencies such as testing reusable internal load restraining systems. It was judged that, with resolution of problems encountered during TOCSA, a truly cost effective system of containerized ammunition shipment could be achieved.

(U) Based upon the success of Project TOCSA, the Assistant Secretary of Army, I&L, directed that a "total system" technique be developed for moving all ammunition in containers for CONUS ammunition plants and depots to forward supply points overseas.

Movement of MILVANS in Trailer-On-Flat Car (TOFC) Service

(U) As a result of the successful testing of the Army's MILVAN container and chassis in rail impact tests conducted at Savanna Army Depot, the Bureau of Explosives of the Association of American Railroads approved the shipment of chassis equipped with newly designed twist locks and double bogie assemblies in TOFC service.

US Coast Guard Acceptance of MILVAN Container for Ammunition

(U) USCG regulations (46 CFR 146.29) prohibited ammunition in containers for ocean shipments. Tests were conducted at the Savanna Army Depot (SVAD) concerning future shipments of containerized ammunition. Based upon the results of these SVAD test, the USCG approved the use of MILVANS for carrying certain types of military ammunition with proper blocking and bracing and not in a coupled configuration. ⁴⁶

(U) Compatibility requirements restrictions of containerized ammunition were lessened to permit stowage of incompatible ammunition in separate containers but in the same ship's hold by the Coast Guard. Such approval of exemption from requirements set forth in sub-part 146.29 of part 46.7 Code of Federal Regulations (CFR) was based upon recommendations of the Armed Forces Safety Board. Based upon these actions, further investigation continues by other Government agencies to revise other compatibility regulations.

Off-Shore Discharge of Containerships (OSDOC II)

(U) In April 1971, DA (DCSLOG) directed a further evaluation of containership discharge. This would be a follow-on effort to the

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Ltr, CO, Savanna Army Depot, from Department of Transportation, US Coast Guard, 21 Dec 70, Subject: Containerization of Ammunition.

evaluation conducted at Ft. Story in December 1970 and would provide the opportunity to explore new equipment, techniques, procedures and systems for handling containers from containerships using both air and surface lighters across beaches in logistics-over-the shore (LOTS) operations. Major emphasis was to be placed on developing means to unload containers from ships, lighterage and chassis with currently available equipment in the Army inventory or available by lease from civilian industry.⁴⁷

Production

(U) During the year, the PM-CS was involved in procurement actions pertaining to two contracts inherited from AMCDT. One contract was with the Fab-Weld Corporation, Simpson, Pennsylvania for the procurement of 6700 containers at a cost of 11 million dollars. 4500 containers of the 6700 total production were to be with restraining devices for the efficient, containerized movement of ammunition. Production of the MILVAN container started in February 1971. However, initial production schedules could not be met by the Fab-Weld Company and a change in the contract schedule was negotiated in June 1971 to permit deliveries for approximately one year.

(U) The other contract with the Trailmobile Corporation, California, was for the procurement of 5600 chassis modified with improved twist and bogie locks for a total cost of 12.7 million dollars. Equipping these chassis with 14 ply tires caused an ancilliary contract with Firestone Tire Company at a cost of \$300,000.

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Ltr, ODCSLOG to CG AMC, 6 Apr 71, Subject: Further Evaluation of Containership Discharge.

Problems

Chassis

(U) Experience with MILVAN chassis revealed problems with the commercial design under conditions encountered by the Army-in-the-field. TACOM was charged with initiation of necessary modifications to the chassis to improve its operational characteristics (e.g.) strengthening of landing legs, improvement of twist and bogie locks, and replacement of 12 ply tires with 14 ply.) Additionally, TACOM was directed to initiate an RDTE effort to design a heavy duty chassis for use in off-road conditions and to be compatible with the needs of the troops under combat conditions.

Container

(U) Similarly, field experience indicated the need for improvements to the MILVAN container. MECOM was tasked to modify containers so that the threshold plate would be substantially fixed to the floor.

Leased Containers

(U) Another problem facing the OPM-CS at fiscal year's end, was that of turn-in of leased containers. In order for AMC to begin general cargo MILVAN pilot operations, MECOM leased 2600 containers from commercial sources. With the leased period at an end, containers had to be returned in an "as received" condition and in the exact serial number sequence in which received in accordance with contract provisions.

Container Production

(U) A final major problem to be noted concerned the MILVAN container production schedule. The Fab-Weld Corporation had only a marginal

capability to produce even under a reduced schedule approved in June 1971. Fortunately, this is not a critical problem since requirements for MILVAN containers were reduced since plans for ammunition movement did not materialize.

Mobile Electric Power

Background

(U) The buildup of US Army troops in Vietnam during 1965 was accompanied by a major electric power shortage that seriously affected the operational capability of the deployed units there. The bulk of electric power used by troops and units in the field was furnished by mobile engine generators. Mobile generators were required in Vietnam because of an almost total lack of available commercial power. For the most part, the mobile generators deployed with the troops were commercial or quasi-commercial models that had been procured to performance specifications mainly to meet general utility usage or were furnished as part of a weapon system. As a result, small quantities of unique or peculiar generators constituted the bulk of the generators.

(U) By the end of 1965, the shortage of reliable electric power in Vietnam had become so serious the Defense Department directed a study of engine generator problems. The study group identified over 2000 different makes and models of generators. In Vietnam alone, the group uncovered 74 different makes and models serving throughout the country making responsive logistics support difficult, if not impossible. The study group further noted that there was no existing DOD management system with full authority over all functional aspects of generators.

Each military service, acting separately, was attempting to solve its own problems with varying degrees of success or failure. The completed study with recommendations was approved by DOD in February 1967. As a result, three major actions were taken: First, the Department of the Army was designated as the standardization assignee for engine generators. Second, the Secretary of the Army was designated as DOD executive agent and directed to appoint a DOD Project Manager for Mobile Electric Power. Third, DOD Directive 4120.11 was published which required all military services utilize the DOD standard engine generator family. It further directed that no procurement of other than standard generators be procured without specific approval of the DOD Project Manager. The standard family was designed by power rating, divided into further tactical and prime classes, and further divided into utility and precise models. On 1 July 1967, the DOD Project Manager for Mobile Electric Power was activated with the overall mission of managing and standardizing mobile electric power for DOD.

(U) Three immediate actions were necessary to accomplish this: Existing supply documentation had to be purified so that disposal of obsolete, obsolescent, or one-of-a-kind generators could be accomplished; continuing proliferation through procurement had to be halted; necessary standardization documents and procurement data packages had to be prepared.

(U) All three actions were undertaken simultaneously. As a result, separate line items were reduced to a total of 770 line items of which 43 were coded standard, 70 were coded limited standard, and 657 were

coded nonstandard and keyed for elimination.

(U) The second action, that of halting the continuing proliferation, was also part of the Standardization Program. Members of the Standard Family were eliminated or new improved members are added, providing continued updating and a continuing ready reference of generators available to the users.

(U) The third action, responsibility for developing the necessary standardization documents and procurement data packages under the standardization program, was allocated to each individual Military Service based upon its past experience, predominance of use and manpower availability.

(U) The benefits and savings accruing to the Government, specifically through standardization and reduction of military components, were both tangible and intangible. The reduction from 2,000 to 35 makes and models would result in an annual management cost reduction from \$85 million to approximately \$2 million.

In procurement, by coordinating and consolidating the requirements of the Military Services for a standard item rather than multiple items, the benefits of larger quantities, more competition and subsequent lower unit costs were achieved.

(U) Although tangible dollar savings are important, the other benefits, basically intangible and non-quantifiable are even more important. The benefits of being able to train maintenance personnel on a limited number of standard sets would improve dramatically the caliber and qualification of maintenance personnel. Prescribed load lists by units in the field will be greatly reduced. Further, all

Military Services using the same generator sets would give field commanders far greater flexibility in emergency situations to divert either end items or parts to the unit with the most critical need.⁴⁶

(U) The Project Manager Office, Mobile Electric Power (PM-MEP), was activated 1 July 1967 by direction of the Secretary of Defense. The Secretary of the Army was designated Executive Agent for DOD and directed to appoint a project manager and negotiate and issue a jointly approved charter. The mission of the Project Manager was to effect management and standardization of Mobile Electric Power Generating Sources within DOD. Consistent with this mission two priority tasks have been assigned:

(U) To develop fully coordinated standardization documents and procurement data packages which could be used to procure a first DOD standard family of generator sets, and to determine the operational requirements for and definition of a DOD standard family of gas turbine engine driven generator sets and/or other power sources. This is known as the second generation family.

(U) Figure 2 shows the current organization of PM-MEP which, with the exception of the Technical Liaison Office, is a fairly standard PM organization. In Fiscal Year 71, the Project was authorized 71 manpower spaces, 2 military and 69 civilians. Not included are the three Service Representatives authorized by PM-MEP charter who are included on the TD of their own parent Service. As the result of voluntary reductions

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See Colonel J. J. Rochefort, USA, Project Manager, Mobile Electric Power, Defense Management Journal, "The Saga of Mobile Electric Power," pp. 12-17.

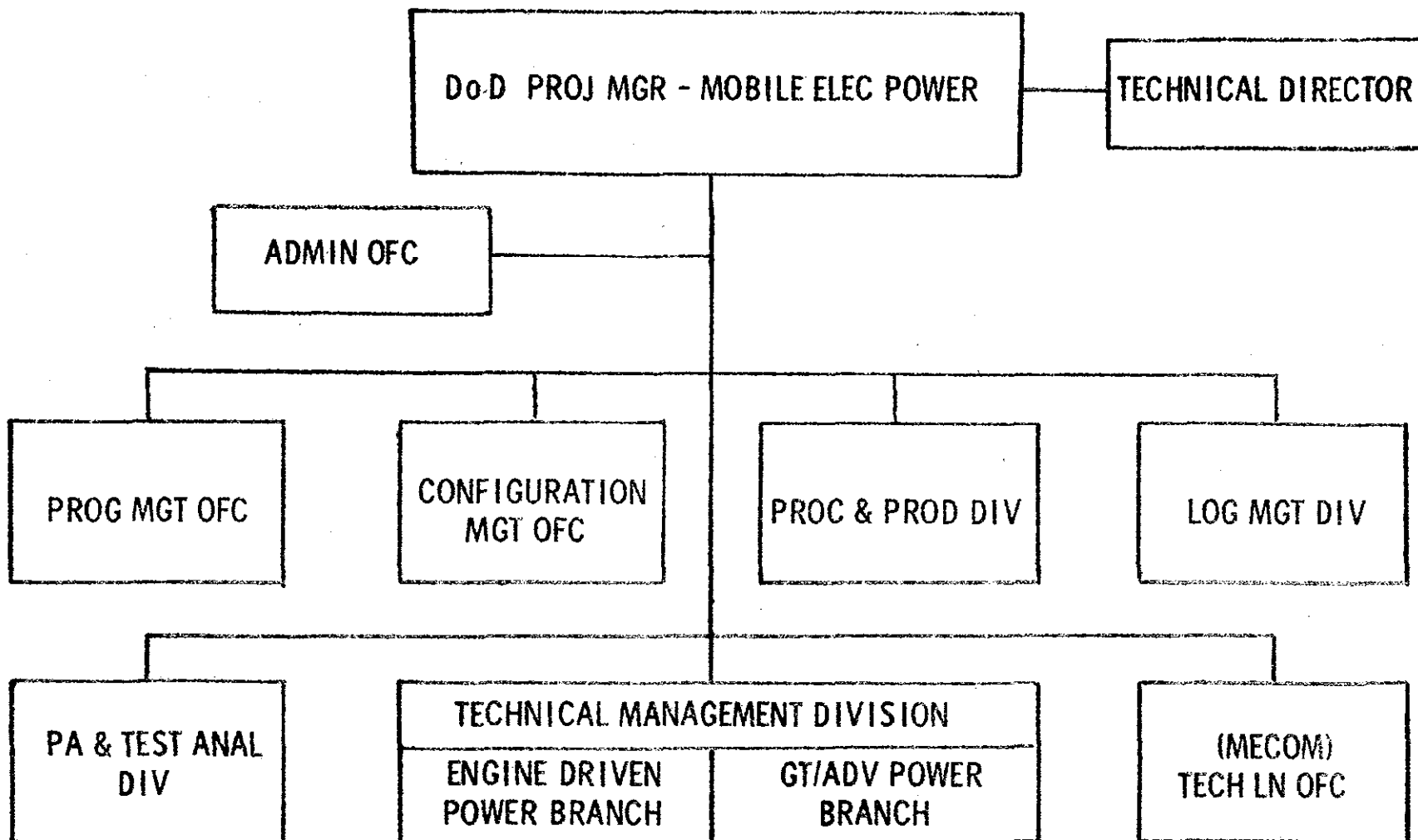


FIGURE 2

ORGANIZATIONAL CHART

SOURCE: AMCPM-MEP-M
30 June 1971

PM-MEP was reduced to 65 allocated spaces plus three non-allocated spaces which would be reflected on the Fiscal Year 72 TD.

(U) During Fiscal Year 71, Project Manager - Mobile Electric Power was actively engaged in a number of concurrent actions to provide greater reliability and maintainability for generator sets throughout the defense establishment. The following summary gives the status of accomplishments of the Project during Fiscal Year 71.

Program Management

Transition Plan

(U) In the Project's Annual Review to the Commanding General, US Army Materiel Command on 30 March 1971, it was announced that the Project was initiating preparation of a Transition Plan which envisioned transition from Project Management to some other type centralized intensive management. Three controls were to remain at Project termination: (1) Integrated procurement direction to prevent proliferation of existing hardware; (2) Deviation control to stop at birth future proliferation from the R&D community; and (3) Stringent configuration management of the DOD family. The Transition Plan was to be prepared in Fiscal Year 72 for CG, AMC, approval.

Charter Revision

(U) The PM-MEP Charter was revised by this Project and approved and signed by Secretary of the Army Stanley R. Resor on 16 March 1971. The primary changes to the original charter were the introduction of

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Material in this portion of Mobile Electric Power was submitted by The DOD Project Manager-Mobile Electric Power in its Annual Historical Summary for Fiscal Year 1971.

Contractor Performance Measurement and Resource Control. These changes provide for greater Project Manager's involvement in these two specified areas. Based on the requirement for annual review and update of the Charter, the Military Services were currently reviewing the Charter for the Fiscal Year 72 update.

Cost Analysis

(U) During Fiscal Year 1971, it was decided to centralize the cost data of PM-MEP in the Program Management Office. To accomplish this, a study was conducted revealing types of data gathered throughout the Project which would form a basis for future cost estimate studies.

(U) Beginning in Fiscal Year 71, the 10kw Turbo-Alternator (PM-MEP) was designated for "Quarterly Systems Cost Status and Forecast" reporting as part of the PROMIS package in accordance with AMCR 11-16, Vol. 3, Change 2. It was estimated that the R&D phase of the 10kw Turbo-alternator program would cost \$10.2 million and the PEMA program will be \$92.3 million.

(U) During Fiscal Year 71, PM-MEP carefully analyzed and managed the contractor's cost and schedule performance in the design and development of the 10kw Turbo-alternator utilizing the contractor's Cost and Performance Reports and the Bi-Monthly Technical Progress Reports. As of 30 June 1971 the contractor was approximately half way through the contract and was beginning the critical EDT program. Contractor cost and performance was to be carefully analyzed during this phase of the program in an effort to control the cost overrun on this cost plus fixed fee contract.

Training

(U) As a result of emphasis placed on training of professional personnel, this Project developed a comprehensive and coordinated training program during Fiscal Year 71. Employees were encouraged to undertake the maximum amount of training consistent with responsibilities and potential. Of the 67 people in HQ PM-MEP during Fiscal Year 71, 11 completed 19 non-Government courses and 39 completed 26 Government courses.

Milestone Reporting

(U) The Program Management Office provided milestone reports to the PM as a key management tool. The milestone listings were prepared based on selected events identified as prerequisite for successful completion of a program and included both Government and industrial actions. Data was collected, collated, and evaluated relative to time, cost and technical performance in order to identify potential problem areas and to initiate corrective action on behalf of the Project Manager.

Research and Development Program

(U) The emergency funding program for increasing reliability and improving the maintainability of generator sets used in Southeast Asia was basically completed in Fiscal Year 71 with the "clean up" work being transferred into the regular program.

Work Breakdown Structure (WBS)

(U) During Fiscal Year 71, the MEP-WBS was updated for distribution to Participating Activities as a summary of their current responsibilities in accomplishing the Project mission.

Program Requirements

(U) In Fiscal Year 71 the generator (MEP) programs were:

Army	\$3.5 million
Navy	.3 million
AF	6.5 million
MC	---
TOTAL	\$10.3 million

Deviations from DOD Standard Family

(U) During Fiscal Year 71 eleven requests for deviations from the DOD Standard Family of generators were received of which nine were approved and two were disapproved.

Product Assurance/Test Analysis

Reliability/Maintainability

(U) Reliability and Maintainability requirements resulted in the delivery from two contractors of Reliability and Maintainability Mathematical Models. This was the first time these types of requirements were incorporated in contracts. They represented a significant technological step forward in the procurement of Mobile Electric Power equipment.

Sampling Plan

(U) An improved Sampling Plan for the gasoline-engine driven generator sets was developed and incorporated by an Engineering Change Proposal. The revised approach contained provisions for penalizing or rewarding contractors, depending upon the quality of equipment being delivered.

Reliability Records and Quality Assurance Plans

(U) Under the Project Manager's guidance, and with the approval of HQ AMC, Reliability Records and Quality Assurance Plans were estab-

lished for selected DOD standard family members. This was the first time these actions were initiated for any Mobile Electric Power equipment.

Technical Management

Standardization

(U) Efforts were accelerated on the first priority task--that of identifying the DOD Standard Family which would be acceptable to the Services and the Defense Supply Agency. Substantial progress was made in the DOD objective to reduce the number of makes and models of mobile electric power generating sources used by the Military Services. MIL-STD 633B, representing the Service standard items, listed 69 generator sets which could be procured without approval of the Project Manager's Office. During this fiscal year, intensified effort reduced this number. A proposed MIL-STD 633C, representing the PM-MEP position as to the current DOD Standard Family, listed 37 items. This proposal was in final coordination by the Navy preparing activity and was expected to be published early in Fiscal Year 72. Of the 37 items for inclusion in MIL-STD 633C, fully coordinated specifications were issued on 13. The balance was covered by specification in process of coordination or fully coordinated Purchase Descriptions, which would be converted to military specifications as soon as the hardware, much of it currently in test, was accepted.

Electromagnetic Interference (EMI)

(U) An intensive, in-depth study of Electromagnetic Interference (EMI) emissions from DOD Standard Family generator sets was accomplished which resulted in a PM-MEP position as to the requirements to be estab-

lished for all future sets. This position was forwarded to the Navy and Air Force preparing activities for final coordination of MIL-STD's 461 and 462. Publication was anticipated early in Fiscal Year 72.

Component Equivalency Program

(U) A formal Component Equivalency Program was established at US Army Mobility Equipment Research and Development Center to reduce the number of sole source suppliers of components for the DOD Standard Family sets. The primary purpose of this program was to assure commonality of components used in generator sets and at the same time, expand the source of supply by qualification of additional suppliers through standard test methods.

Qualitative Materiel Requirement (QMR) for Electric Power Plants

(U) During this fiscal year, this Project completed coordination with the Army on the Qualitative Materiel Requirement (QMR) for Electric Power Plants. Due to size and weight requirements, this QMR would probably be met through the use of gas turbine engine driven generator sets. To accomplish the Army coordination of this QMR, a System Description/Coordinated Test Program In-Process Review was held in February. The major input by the PM-MEP into this effort was to reduce and eliminate, where possible, characteristics which would be unnecessarily complex or restrictive. Those characteristics agreed upon were believed to be reasonable and obtainable without an extensive research and development (R&D) program. The PM-MEP remained a strong advocate of making maximum use of available commercial equipment. A notable exception to the use of commercial equipment was the development of the 10kw Turbo-alternator. A gas turbine engine in this size range

was not available, and a development effort was necessary for this application. In the last part of this fiscal year, the QMR was re-validated as a Materiel Need (MN).

Gas Turbine and Other Advanced Power Sources

(U) At the request of the PM-MEP, US Army Mobility Equipment Command initiated action to develop an Advanced Procurement Plan and a Program Management Plan for the 10kw Turbo-Alternator. These plans were required to address all aspects of development and procurement of the 10kw Turbo-alternator. A primary goal of the PM-MEP was the smooth transition from R&D into the most practical and economical means of quantity procurement. The feasibility and cost effectiveness of larger turbo-alternators versus synchronous (gear driven) generator sets was addressed in a study under the auspices of USAMERDC initiated in the final quarter of this fiscal year. Although other advanced power sources may be fielded for special purpose use, broad application of these units and any real impact upon the DOD Family is considered to be sometime in the future. The definition of future members of the Mobile Electric Power Generating Sources Family, including required ratings and identification of specific power sources would be accomplished through the Tri-Service Joint Panel on research and development of Mobile Electric Power Generating Sources established in Fiscal Year 70.

Configuration Management

(U) An Interservice Configuration Control Board was established in 1971 for the 0.5 thru 10kw gasoline engine generator sets. Interservice Configuration Control Boards had previously been established for the 5

and 10kw diesel engine generator sets and for the 15, 30, 60, 100 and 200kw DOD diesel engine generator sets. Board Members evaluate each proposed change for its life cycle impact on each functional area (engineering, supply and maintenance). Included was a tight control of cost growth.

Procurement & Production

Procurement of DOD Standard Family Sets

(U) Progress was made in the procurement of 15-200kw DOD Standard Family sets. Contracts were awarded during Fiscal Year 70 for 60, 100 and 200kw sets. Prototype models for these sizes were presented to the Government for extensive testing prior to releasing the sets for production manufacture. Delays have been encountered in awarding a contract for 15 and 30kw sets as a result of protests to GAO and subsequent court actions. The Court of Appeals ruled against the contractor; however, the contractor attempted to have the case reviewed by the Supreme Court. Procurement action remained suspended during the interim.

(U) Standard Family members were selected for 5 and 10kw diesel sets as a result of parallel development contracts awarded to Onan Division of Studebaker Corporation and Consolidated Diesel Electric Company during Fiscal Year 70. The selection was made following extensive testing of prototype models including approximately 2500 hours of endurance running during which the Onan models proved to be superior. A redesign effort was awarded to Onan for elimination of certain discrepancies identified during the initial testing phase. Following the redesign

effort, further testing was to perform to assure that the sets are suitable for DOD-wide use prior to awarding a production contract.

Centralization of Procurement

(U) One of the primary objectives of this Project was centralization of procurement for mobile electric power requirements. In accordance with the DOD commodity assignment for FSC 6115, action was taken to assign all production procurements to Defense General Supply Center (DGSC), Richmond, Virginia. Efforts toward this objective resulted in assignment of 62.5 percent to total line item requirements to DGSC in Fiscal Year 71 compared to 36.8 percent for Fiscal Year 70. The percentage would have been even greater except for assignments to individual Services for placement on existing contracts where new procurements were impracticable.

Solicitation Review

(U) Review of solicitation documents for MEP requirements resulted in identification and correction of many discrepancies that could have delayed or prevented award of contracts or resulted in difficulties with contract administration. The high incidence of discrepancies noted in DGSC solicitations was brought to the attention of that Center and resulted in assignment of more experienced buyers to the generator branch.

Contract Awards & Surveillance

(U) Total dollar value of contract awards for mobile electric power requirements during Fiscal Year 71 exceeded \$21 million. Surveillance was maintained on approximately 26 separate contracts containing a total of 43 major hardware line items to assure timely deliveries of

quality equipment into the DOD supply system. Close monitoring of contract progress resulted in early identification, minimizing the overall impact of problems causing delinquencies.

Logistics Management

Redistribution of Large Generators

(U) During Fiscal Year 71, the Logistics Management Division was most active in affecting timely redistribution of large generator sets. Serving as a focal point and maintaining an overview of excess of large generators and receiving informal communications from other Government Agencies as well as the Services, many instances of redistribution have been effected that eliminated the need to procure. Examples were the redistribution and retrograde of 1500kw Electromotive generators and the 500kw Schoonmakers for the establishment of a power pool by the Office Chief of Engineers. Also redistribution was effected to provide standby generators for Defense Supply Agency activities and Army activities as well as the Atomic Energy Commission. Department of State was most active in obtaining for AID (Agency for International Development) those generators which are truly excess to all the Services' requirements. Specifically, the Philippine Government has been purchasing large fixed type generators which are not included in the PM-MEP Family.

Vietnam and Europe Theater Standardization

(U) Vietnam generator standardization continued to improve during Fiscal Year 71; approximately 97% of all generators in Vietnam were either DOD or interim standard generators. As Fiscal Year 72 troop

withdrawals from Vietnam materialize it was projected that conditions would permit maximum effort toward Europe and CONUS standardization. Approximately 75% of all generators in Europe were standard. Increased emphasis would be placed during Fiscal Year 72 on Europe modernization and standardization. Europe was approximately 92% standardized on 1.5-10kw DOD generators and approximately 53% of all diesel generators (15-200kw) in Europe were interim standard to this theater. As DOD Standard Diesel Generators (15-200kw) were available, Europe would receive priority allocation to satisfy preposition War Reserve requirements and replacement requirements for operating stocks.

Preservation and Packaging

(U) As a result of the study initiated by the Project and conducted in coordination with all Military Services/Defense Supply Agency, procedures relative to the furnishing of battery acid (electrolite) with the initial distribution of generator sets from production and/or depot repair facility were revised to remove this acid within the packaging barrier. The deletion of the requirement to ship electrolite within each generator would facilitate future shipments by removing them from hazardous materiel storage and handling requirements. A Military specification on the Preservation and Packaging of Mobile Electric Power, developed by the Services in conjunction with this Project, reflects this change of policy.

DOD Standard 60, 100 and 200kw Generator Sets

(U) Considerable effort was expended during the past year in monitoring the initial procurement contracts for these sets. Personnel attended several inter-service meetings at the contractors' plants to

review and assess the progress being made by the contractor on these sets. Maintenance demonstrations were witnessed, maintainability program plans and mathematical models were reviewed, drafts of Tech Manuals and provisioning data were examined, and assessments made as to the compliance with contractual requirements.

Diagnostic Equipment for Engine Generator Sets

(U) Investigation of using equipment to diagnose malfunctions in engine generator sets continued. A MECOM task group was established to work with the Army Tank Automotive Command (TACOM) on adapting Automatic Test Equipment for Internal Combustion Engine Powered Materiel (ATE/ICEPM) to engine generator sets. After several meetings between MECOM and TACOM, a proposed scope of work was developed. This proposed program covers a design study and design and development of transducer kits, including hardware and software, for six sizes of generator sets currently in use by the Army. During the study and development phases, consideration would be given to incorporating the kits at a later date to cover the complete family of DOD generator sets from 0.5 to 200kw. The design consideration would be such as to insure an orderly application of the ATE/ICEPM to the family without modification of the existing hardware and with maximum standardization among transducer kits.

Planned Maintenance Concept for Gas Turbine Engine-Driven (GTED) Generator Sets

(U) The evaluation of a modified maintenance concept for GTED sets, initiated in Fiscal Year 70, continued. This concept represents a considerable departure from established procedures wherein the complete

end item would not be returned for depot overhaul on a usage or condition basis as a normal practice. Depot level support of these sets would be limited principally to the timely overhaul of assemblies/components to ensure adequate support for field maintenance operations. Appropriate data elements, concerning unit readiness and support costs, were being assembled and analyzed to determine the desirability of implementing the proposed concept.

Consolidation of Requirements

(U) During Fiscal Year 71, unprogrammed/emergency requirements for one service continued to be diverted to another Service's contract utilizing existing options. This continued to be most productive since it curtailed the introduction of new makes and models, yet met the Services' urgent requirements in a time frame that was compatible with the urgency of need. Significant strides were made in curtailing the introduction of new makes and models into the DOD supply system. The Air Force practice of awarding "requirement type" contracts enables maximum latitude in placing new requirements on the contract without the restriction of an upper limit imposed by the conventional option process.

Night Vision*

Introduction

(U) During Fiscal Year 1971 the Project Manager, Night Vision provided management of designated night vision items and improved night vision capability for the Army including centralized management for research and development procurement and production.

*For the most part material in this portion was submitted by the Project Manager, Night Vision.

(U) Night Vision equipments provide the Army with the ability to observe aircraft, personnel, weapons and ground targets; to assist in directing fire power; and to work under cover of darkness. Over the past three decades, four distinct techniques for improving night vision have evolved: Near Infrared, Low Light Level Light Intensification and, Battlefield Illumination and Far Infrared.

(U) The primary objective has been to increase night combat effectiveness of US forces in Vietnam. Secondary goals have been to determine the doctrine and concepts of operational and tactical employment of night vision equipment under combat conditions and to outline extended Army needs so that a basis of issue on a worldwide plan can be determined for all night vision equipment. These objectives have been accomplished in varying degrees by accelerating the development of certain night vision systems, by conducting operational Continental United States (CONUS) tests, and by evaluating the equipment under combat conditions in Vietnam.

Changes in Command Responsibility

(U) On 31 March 1970, the Office of the Project Manager, Southeast Asia Night Operations was disestablished and its responsibilities were transferred to other management elements within AMC. On 1 July 1970, the Office of the Project Manager SEA NITEOPS was placed under the operational control of the Project Manager, Night Vision. The Project Manager, SEA NITEOPS was merged with PM-NV effective 23 December 1970. The Night Observation Test and Training Support Detachment (NOTTS) continued under the operational control of the PM-SN and then assigned to USAECOM at the time of the merger. Some of the SEA NITEOPS items not

directly applicable to the PM-NV program were assigned to the Commodity
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Commands or other Projects.

(U) With the assumption of responsibility for additional items
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and missions, Degree I status was granted to the Night Vision Project.
This made key, knowledgeable personnel in the SEA NITEOPS Project
Office which was being disestablished available to Night Vision.
Strength for Project Night Vision was set as follows effective
23 December 1970:

	<u>OFF</u>	<u>WO</u>	<u>EM</u>	<u>TOTAL MIL</u>	<u>CIV</u>	<u>AGG</u>
Authorized Strength:	9	0	4	13	79	92
Structure Strength:	8	0	4	12		
Required Strength:	8	0	4	12	80	92

(U) Effective with the merger on 23 December 1970 of the functions
of PM, SEA NITEOPS with PM, Night Vision, the US Army Surveillance Tar-
get Acquisition and Night Observation Field Support Group (SFSG),
formerly NOTTS Detachment, was assigned to Headquarters, US Army
Electronics Command (USAECOM) and further assigned it to the OPM-NV.
Both actions effective 23 December 1970.

(U) The Project Manager, Night Vision operated during Fiscal
Year 71 under authority for centralized management of his specific
project as outlined in his approved charger dated 21 April 1970. A
revised charter dated 31 December 1970 was submitted by Commanding

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(1) Ltr, Vice Chief of Staff, USA to CG, USAMC, 31 Mar 70, Subj:
Management of Night Vision in SEA Night Operations (SEA NITEOPS) Program.
(2) Msg, Deputy CG, USAMC, 30 Jun 70, Subj: Transfer of Management Re-
sponsibility, from Project SEA NITEOPS to Project Night Vision, DA Gen-
eral Orders 64, 1 Apr 71.

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(1) Ltr, MG Walter Elotz, Jr. CG, USAECOM, to CG, USAMC, 14 Jul 70,
Subj: Upgrading Project Night Vision to Degree I (2) DA General Orders
No. 64, 1 Apr 71.

General, US Army Materiel Command to the Chief of Research and Development. No action was taken by OCRD. During Fiscal Year 71, the Project continued under the leadership of Col. A. T. Surkamp and LTC H. B. Blanchard, Jr., as Project Manager and Deputy Project Manager. Col Charles R. Lehner, Jr. and Mr. Clifford J. Spilker served in the same capacity with operational control of the SEA NITEOPS Project thru 25 March 1971.

Facilities

(U) On 25 August 1970, action to secure joint use of office space for the NVL and PM-NV was completed and carried through DA approval prior to its submission to the Congress for funding authority. Congress approved the action as of 30 September 1970. USAMC Installation and Services Directorate was tasked to secure the Kel-Tech Annex. It appeared that negotiations for the building would be completed at any moment, and it seemed reasonable not to physically merge until the combined Project could move into its new quarters. With the availability of the building still uncertain, further hesitation in merging was intolerable. The merger was effected 25 March 1971 within existing space in two separate locations which had been occupied by PM-NV and PM-SN. The Technical, Logistical, Procurement, and Configuration Management elements were located in the Kel-Tech Building in the old SEA NITEOPS quarters, while Project Executive Offices, Operations, Programs, and Product Assurance elements were placed at Fort Belvoir.

Technical Data by Systems

(U) The night vision systems under the purview of the Project Manager, Night Vision fall into the general categories of airborne or ground.

Airborne Systems

(U) The Image Intensifier System, Night Vision (AN/ASQ-132)
(INFANT) (Hughes Aircraft Corp. Mfr. Qty - 36) an air-to-ground, passive, light amplification, integrated target acquisition and fire control system is nose mounted on a UH-1C equipped with the M-21 armament system. It consists of a low light level TV sensor and display, a direct view image intensifier sensor and display and covert lights for navigation, surveillance and fire control. The system would provide an improved integrated target acquisition and fire control system, in accordance with ENSURE 100, which would enable the crew of a rotary wing aircraft to detect ground targets using light amplification sensors, recognize them from real-time display and direct the fire of all onboard weapons. A secondary mission would be aircraft navigation, reference QMR 1539c(39). The Iroquois Night Fighter and Night Tracker (INFANT) consists of a low light level TV sensor and display, a Direct View Image Intensifier sensor and eyepiece, and covert searchlights.

(U) The INFANT's two night vision sensors are mounted on the nose of the UH-1M helicopter in an integrated turret assembly which attaches to the existing external hardpoint provided for the M-5 grenade launcher. The sensor in the left turret is a low light level (LLL) TV camera called the remote view subsystem. This subsystem is used for navigation, surveillance and fire control by either the pilot or the

co-pilot/gunner. The sensor in the right turret is an image intensifier combination called the direct view subsystem. This subsystem is used for surveillance and fire control. It is used by the co-pilot/gunner. The M-21 weapons system is directly slaved to the INFANT system sensors and consists of a mini-gun mounted on each side of the helicopter and a removable rocket pod attached to each pylon. An IR filtered search-light is installed on each mini-gun to augment the natural illumination covertly.

(U) The searchlights use xenon lamps and are equipped with a filter which eliminates most visible light. The lights are on the gun mount such that they are boresighted with the gun's line of sight. The LLLTV picture presented by the remote view subsystem is displayed to the pilot on an 8" video monitor to the right of the instrument panel and to the co-pilot/gunner on the same type of monitor to the left of the panel. The display for the direct view image intensifier subsystems is an eyepiece attached to the end of a 9' fiber optic rope. The sighting of the direct view subsystem may be operated independently of the remote view subsystem or, if desired, both sensors can be slaved together to follow a single command. When not in use, the sensors are turned to a stowed position.

(U) The Airborne Searchlight AN/ASS-2 (ABN/SL) (AiResearch Mfr. Qty - 6) is a self-contained illumination system, palletized for quick installation in UH-1 helicopters, to be used to provide illumination of areas to assist maneuver elements in the conduct of offensive, defensive and security operations. The searchlight, when properly used, can extend the range of aerial and ground passive night vision devices by increasing

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the ambient light level.

(U) Its technical and design objectives were to provide a visible IR airborne illuminator, palletized for quick installation or removal in rotary-wing aircraft, which would illuminate a large battlefield area at several times moonlight level so that the effective range could be extended for external equipments having light-amplification sensors.

(C) The Night Vision System, Passive Infrared (AN/AAS-29) (HAC/FLIR-Hughes Aircraft Corporation Mfr. Qty - 4) is a passive IR sensor package mounted in gimbals and installed on a UH-1C equipped with the M-21 armament subsystem. Detected radiation signals would be imaged on pilot and co-pilot real-time displays. Simultaneously, the reticle on the display would be boresighted with the weapons, enabling accurate firing of the M-21 armament upon command.

(C) Its technical and design objectives were to provide an integrated target acquisition and fire control system, which would enable the crew of a rotary wing aircraft to detect ground targets using passive IR sensors, recognize them from real-time displays, and accurately direct the fire of the M-21 armament subsystem and the 2.75" rockets. A secondary mission is aircraft navigation. The AN/AAS-29 is a passive IR sensor mounted in gimbals on a UH-1C equipped with the M-21 armament subsystem.

(C) The Fire Control System, Infrared (AN/AAQ-5) (AGC/FLIR - Aerojet General Corp. Mfr. Qty - 10) is a gimbal mounted passive IR sensor package installed on a UH-1C equipped with the M-21 armament subsystem. Detected radiation signals would be imaged on pilot and co-pilot real-time displays. Simultaneously, the reticle on the display

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would be boresighted with the weapons, enabling accurate firing of the M-21 armament upon command.

(C) The technical and design objective was to provide a surveillance target acquisition, and fire control system, in accordance with ENSURE No. 78, which will enable the crew of a rotary-wing aircraft to detect ground targets using passive IR sensor, recognize them from real-time displays, and accurately direct the fire of the M-21 and 2.75" rocket armament subsystems. Detected radiation signals are imaged on pilot and co-pilot real-time displays.

Ground Systems

(U) The Night Vision Periscope (AN/VVS-2) (Chrysler Corporation Mfr. Qty - 2) Advanced Development Feasibility Model and a Redesigned Model is a passive, non-stabilized, binocular, battery powered, 18mm or 25mm three stage light amplification sensors, (magnification - 1X) mounted on a test vehicle (M-113 APC). Viewing is remote by use of prisms. Vehicular targets can be detected at 300 meters without supplementary light. The field of view is 45° with an elevation adjustment of +30° to -10°.

(U) The technical & design objective was to provide an image intensification viewer capable of being remotely used by an armored vehicle driver during closed-hatch operation for purpose of general surveillance and/or operation of the vehicle without supplementary illumination.

(U) The Night Vision Sight Individual Served Weapons (AN/PVS-4) Varo, Inc. Mfr. Qty - 31) is a passive device mounted on and boresighted to the weapon (M-14/M-16) to provide accurate aimed fire at

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night. The device would be self-contained and battery operated. It would be capable of employment as a handheld viewer as well as a weapon mounted sight for use in forward areas as a handheld night observation device to detect and identify targets and to observe various operations.

(U) The technical and design objective was to provide a passive night vision device utilizing ambient radiation from starlight or moonlight for illumination. The range under starlight conditions is 400 meters, moonlight conditions will increase the range to 600 meters. The field of view is 8° (140 mils). Two Mallory type 930 batteries (2.5V) provide the power requirements.

(U) The Night Vision Sight Crew Served Weapons (AN/TVS-5) (Varo, Inc. Mfr. Qty - 18) is a passive system mounted on and boresighted to the weapon (usually a machine gun or recoilless rifle). The sight may be dismounted to permit unimpeded daylight use of the weapon. In the tripod mounted role, it would be used as an observation device to detect, identify, and observe friendly and enemy operations and/or direct fire control of artillery.

(U) The technical and design objectives were to provide a means for accurate aimed fire of crew served weapons at night, using ambient light (moonlight or starlight) for illumination. The field of view is 9° (157 mils). Range under moonlight conditions is 1200 meters; under starlight conditions the range is 1000 meters. Disposable mercury 2.7 volt batteries provide 12 hours of operational power.

(U) The Searchlight Infrared (AN/VSS-3) (Varo, Inc. and Polan Mfr. Total Qty - 630) is a variable focused xenon source producing

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a minimum of 50 million peak beam candle power at a power input of 1.4 KW is boresighted with the vehicle's main armament where applicable. A remote filter may be engaged to provide infrared invisible illumination or white visible illumination. Design provided for vehicular, airborne and tripod mounting. Power supply would be provided by the vehicle using the light.

(U) The technical and design objectives were to provide a visible or infrared (IR) light assist for use on tanks and combat vehicles. In the IR mode, illumination would enable detection of a vehicular target at 1000 meters using the crew served weapons or the XM-44 periscope. In the visible mode, illumination would enable detection of vehicles at 1500 meters using the M119 telescope. Peak beam candle-power is 50×10^6 . Beam spread in the focus mode is 1° . In the spread mode the beam spread is 7° . The required power input is 1.4KW.

(U) The Searchlight, Xenon (AN/VSS-1/2) (Varo, Inc. and Electro Space Mfr. Qty - 928) is a jeep, tank or tower mounted xenon searchlight capable of operation in the visible or infrared mode, providing a compact or a spread beam. Tank mounted lights are controlled from inside the vehicle. Tower mounted lights are used for perimeter lighting. A limited number of helicopter mounted searchlights were evaluated by ACTIV.

(U) The technical and design objectives were to provide a visible or infrared (IR) light source for tanks (AN/USS-1/2), for jeep (AN/MSS-3/4) (pedestal mounted) or tower (AN/GSS-14). The beam spread in the narrow mode is 1° and 7° or 124 mils in the spread mode. Peak candle-power is 100 to 125 million when in over-drive. The power source is

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a 28 volt DC 100 AMP system powered by the using vehicle itself or another standard generation. The system weight is 230 pounds.

(C) The Night Vision Device, Thermal Imaging (AN/TAS-2) (Hughes Aircraft Corp. Mfr. Qty - 14) is a tripod or vehicular mounted observation device utilizing thermal imaging techniques for surveillance enabling a ground observer to detect and recognize ground targets from a real-time display. Since most military targets are warmer than their background and emit more radiation, far IR systems have the advantage of being able to detect targets against complex or obscured backgrounds.

(C) The technical and design objectives were to provide a man-portable ground surveillance system. This is a far infrared device, hence passive and independent of ambient night illumination, artificial or natural. The system range is 2000 meters with a field of view 2° X 5° (35 mils X 89 mils) powered by a separate zinc-air power supply. System weight is 120 pounds designed into 3 manpack modules.

(C) The Surveillance Set Infrared (AN/VAS-1) (Firti - Phillips Broadcast Equip. Co. Mfr. Qty - 5) is a stabilized far infrared imaging system with remote view display mounted on M60 series tanks. An infrared scanner sensor collects the battlefield emitted radiation and converts the information to a remote real-time crew display, including azimuth and elevation indications. With the vehicle positioned strategically, the system scans the background scene to collect emitted thermal radiation. The field of view is 4° X 10° with a capability to slew to 120° . The detection range (vehicular) is 3000 meters whereas recognition is 2000 meters. A 1KW searchlight in lieu of the standard 2.2KW searchlight is mounted with the surveillance set to illuminate

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detected targets for other tanks.

(U) The technical and design objectives were to provide a vehicle mounted target detection and imaging device to detect and recognize vehicular targets on a real time display.

A major problem is that the present size of the AN/VAS-1 has necessitated that a significant portion of the system be mounted external to the M48A3 tank leaving it vulnerable to destruction or damage.

(C) Remedial action taken based on the success of the AN/VAS-1 during MAASTER testing, HQ, AMC has established and funded an AD program leading to the development of two (2) palletized FIRTI type devices and two (2) periscope type devices. An objective of the program will be to place as much of the system within the tank as possible, which is a recommendation made by DA. The new program will hopefully lead to a system configuration that will prove suitable for use in a combat environment.

(U) The Viewer, Infrared (AN/PAS-7) (Phillips Broadcast Equipment Corp. Mfr. Qty - 20) is a non-stabilized, infrared imaging system mounted in a handheld monocular viewer powered by a rechargeable battery. The scanner sensor collects the battlefield emitted radiation and converts the information into a real time display, including indications of relative azimuth and elevation of objects.

(U) The technical and design objectives were to provide a passive, handheld, thermal detection and imaging device for night time use to detect and recognize personnel targets at short ranges from a real time display. The image displayed indicates relative azimuth and

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and elevation. System range for man target recognition is 200 meters. Sector scan is 6° vertical by 12° horizontal with a focus of 8 feet to infinity. Resolution is 2 MR; magnification is 2.5X; weight of viewer with belt mounted battery is 10.7 pounds.

(U) The Searchlight General Purpose Xenon, Wheel Mounted (AN/TVS-3) (Varo, Inc. Mfr. Qty - 135) is a 30" Diameter Xenon Searchlight used general battlefield illumination, sector or perimeter defense and control of artillery. Operates in the visible and infrared mode providing a compact or spread beam. It is a trailer mounted searchlight. A 100-foot power cable is provided to permit the searchlight to be located away from the power source.

(U) The technical and design objectives were to provide a visible searchlight for use in battlefield illumination. An infrared capability will be provided for covert use with night vision viewing devices. The beam spread is 1.3° for the focused beam, 10.5° for the spread beam, 9.25° for the defocused beam. Peak candlepower is rated at 900 million to 1 billion at 20KW. Visible range is 30 / miles. The power source can be any 10KW or greater 120/208 volt 3 phase, 400 cycle, 4 wire power source.

(U) The Binocular, Electronics (AN/PVS-5) (ITT, Inc. Mfr. Qty - 261) is a non-stabilized, face mounted, passive image intensifier system for performing hand-free individual tasks during the hours of darkness, utilizing ambient radiation from the night sky for viewing at close range. With IR filtered vehicle headlamps, the range is approximately 50 meters.

(U) The technical and design objectives were to provide a multi-purpose, self-powered 1X magnification light amplification viewer designed to allow freedom of both hands. It will be used to detect enemy IR sources, read maps and perform other closeup tasks during darkness and without visible light. The field of view is 27° (480 mils). The system is powered by a 1.3 volt mercury battery (disposable) providing 40 hours of continuous operation.

(U) Funding and Programing Fiscal Year 71

(U) RDTE: Three DA projects of 17 specific RDTE tasks were funded and managed during Fiscal Year 71.

(U) PEMA: Two PEMA line items were funded during Fiscal Year 71.

(U) OMA: The operations of the Office of the Project Manager, Night Vision were funded in the following amounts due to the consolidation of two (2) project manager offices:

Project Manager, Night Vision: \$614,480

Project Manager, SEA NITEOPS: 300,000

TOTAL \$914,480

Approved Fiscal Year 1971 and Prior Year Carryover Programs:

	<u>Program</u>	<u>Obligations</u>	<u>Commitment</u>	<u>Carryover</u>
RDTE	12,118,263	9,495,128	1,086,949	1,524,186
PEMA	52,537,942	49,063,043	2,382,954	1,091,945

RDTE and PEMA Programs during Fiscal Year 71

(U) The following programs were approved for PM-NV systems for Fiscal Year 71 (Excludes carryovers):

1. RDTE:

<u>Element Code and DA</u> <u>Project/Task Number</u> <u>Title</u>	<u>FY-71</u> <u>Approved Program</u>
6.32.10A 1S16321ODK50	
Image Intensifier Aerial Devices-01	\$700,000
Infrared Aerial Devices-02	465,000
Aerial Systems Integration-03	500,000
Aerial STANO Field Test Support-04	300,000
6.37.10A 1S663719DK70	
Image Intensification Ground Devices-01	\$1,515,000
Infrared Ground Devices-02	690,000
Radiation Sources Ground Devices-03	400,000
Night Vision Systems for Combat Vehicles-04	2,723,000
STANO Field Test Support-06	355,000
Night Sights for Missile Systems-07	720,000
Equipment for Individual Soldier-08	435,000
6.47.23A 1S664723DL70	
AN/VSS-3, Searchlight, 1KW, Infrared-01	155,000
AN/USS-6, Handheld Invisible Light Source-02	80,000
AN/PVS-4, Night Vision Sight Individual Served Weapon-03	525,000
AN/TVS-5, Night Vision Sight Crew Served Weapon-04	500,000
AN/PVS-5, Binocular, Electronic (Night Vision Goggles)-05	588,000
AN/TAS-2, Night Observation Device, LR (Thermal)-06	335,000
Internal Use of PM-NV	<u>75,000</u>
	TOTAL \$11,061,000

2. PEMA:

<u>Title</u>	<u>FY-71</u> <u>Approved Program</u>
(U) AN/VSS-1, Searchlight, Xenon Infrared, 2.2KW	\$1,800,000
(U) AN/AAQ-5, AGC/FLIR	<u>500,000</u>
	TOTAL \$2,300,000

(U) The Fiscal Year 72 RDTE program was not issued to the Office of the Project Manager, Night Vision as required by the Charter because

[REDACTED]

of the uncertain status of the OPM-NV. However, the Fiscal Year 72 PEMA program was issued directly to the Office of the Project Manager, Night Vision.

Current Development and Production Contracts

(U) As of 30 June 1971, the Office of the Project Manager, Night Vision was responsible for managing thirty five (35) active contracts for a total dollar value of \$62,432,864.66, of which ten (10) were production contracts in the amount of \$33,546,234.11 and nineteen (19) development contracts in the amount of \$28,732,720.55. Balance of six (6) totalling \$153,910.00 are in the miscellaneous category (trailer rental, services, etc.). During Fiscal Year 1971 the following items were delivered by the contractors:

<u>Item</u>	<u>Quantity</u>
AN/VSS-1, Searchlight, Xenon, IR, 2.2KW	538
AN/VSS-3, Searchlight, IR, 1 KW	94
AN/TVS-3, Searchlight, GP Xenon, 20 KW	12

Transfer of Project Managed Items

(U) During the year the management responsibility was transferred to other agencies for the following items:

- a. Night Vision Sight, Individual, complete with 25mm tube, Type AN/PVS-1, 2, 2A, FSN 5855-087-2942, 5855-087-2947 and 5855-179-3708 to ECOM.
- b. Night Vision Sight, Crew Served, complete with 25mm tube, Type AN/TVS-2, and 2A, FSN 5855-087-3144 and 5855-791-3358 to ECOM.
- c. Binocular, Electronic, Model T-7, Face Mounted, AN/PAS-5, FSN 5855-054-4408 to ECOM.

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- d. Night Vision Sight, Tripod Mounted (NODLR 1 1/2) AN/TSS-7, FSN 5855-133-5935 to Night Vision Laboratory.
- e. Periscope, Night Vision, AN/VVS-2 to Night Vision Laboratory.
- f. Radar Set, AN/PPS-9 to ECOM.
- g. Surveillance System, AN/ASQ-127 (NVASS) to Night Vision Laboratory.

Demonstrations and Evaluations

Night Hawk

(U) The Night Hawk was evaluated by the ACTIV Team in RVN prior to this period. The report was published during this period; however, no action was taken by USARPAC. Two Night Hawk units were evaluated by Project MASSTER in STANO Airborne System tests. The system was tested in conjunction with other night vision systems, such as INFANT and FLIR and received a favorable report.

(C) A ground application of the Night Hawk using only the NOD-MR (Night Observation Device - Medium Range) and the 1KW Searchlight was demonstrated in SEA for perimeter and base defense. The reaction was favorable and stimulated requests for other applications of the Night Hawk, such as a Tower Mounted System which was requested by DSPG. In addition, the Navy has also expressed an interest in Night Hawk mounted on a boat for river patrol. The Air Force requested a single cluster Night Hawk for use on fixed wing aircraft in a classified project. The single clustered unit was tested by the Air Force at Eglin Air Force Base. The results were successful and the unit was further requested to be released for deployment for approximately sixty days. The tests were completed and the unit returned. A report of the results of the

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tests has not been received to date.

Airborne Searchlight, AN/ASS-2

(U) A STANO IPR was held following MAASTER tests. The results of the tests were highly favorable and included a recommendation to deploy the item. USARV, however, declined and the units were then directed for use in CONUS, two units for riot control under MDW and two units at MAASTER for test support. IR filter development continued although accelerated development of Airborne searchlight was terminated per DA direction as a result of the STANO IPR. A Quartz filter and a liquid filter were demonstrated during this period as parallel approaches for IR filters. The Quartz filters did not perform satisfactorily and attention was directed to the investigation of the liquid IR filters. Preliminary tests conducted at Edwards Air Force Base by PM-NV and STANO Field Support Group were successful resulting in further feasibility tests by NVL. These tests were favorable and resulted in a request by Project MAASTER for use of the IR filter in conjunction with the ARPA Big-Light test in August 1971.

HHTV Swimmer-Detector Program (DSPG Sponsored)

(C) The Sonar/Infrared Swimmer Detection System (SIDS), consisting of a commercially available sonar (AMETECK Straza DHS-2) and an Army AN/PAS-7, mounted on a shaft were evaluated in the Panama Canal Zone in February 1971 and Apalachicola, Florida in April 1971 to:

"Compare capabilities of the system in detection of surface swimmers and to determine specific environmental limitations on the performance of systems. The tests proved that, with few exceptions, swimmers were detected by IR at consistently greater ranges than by

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sonar sensors. The successes expedited the modification and testing in SEA for DSPG of three SIDS. The MACV demonstrations in May 1971 were successful. Units have been returned to NVL. "

Evaluation of the AN/PAS-7 by 8th US Army, Seoul, Korea

(U) Two AN/PAS-7 viewers were evaluated on the Guard Posts in the DMZ along the Barrier Fence of the DMZ and along the Imjin River to demonstrate feasibility of the viewer under difficult circumstances involved with the guarding of the DMZ. The evaluation covered the period from 14 April through 26 July 1971 and was a success. Detections were made in inclement weather, rain and fog. The viewer is recommended for use on guard posts, barrier fences, ambush patrols and similar situations.

Mine Detection Program

(C) In January 1970, DA directed AMC to investigate the use of airborne infrared systems such as the FLIR in the mine detection role using available systems and provided funds for the purchase of seven (7) Handheld Thermal Viewers similar to the AN/PAS-7 but incorporating certain modifications to enhance their utility in mine detection. Tests were started using infrared systems available from SEA NITEOPS with full cooperation from the USAECOM Night Vision Laboratory and USAMERDC. Emergency funds in the amount of \$2,795,000 were released to AMC in June 1970 for the following:

(U) Further mine detection testing; the modification of AN/VAS-1 (Far Infrared Target Indicator) systems on the M48A3 tank to enhance their usefulness for mine detection; changes in two airborne Forward Looking Infrared (FLIR) systems, (AN/AAQ-5) which required the addition

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of another display for better mine detection capability; the construction of a circular scan FLIR to determine its feasibility as a low cost, lightweight, airborne thermal imaging system. This item is now called the Lightweight Airborne Thermal Imaging System (LATIS). Delivery from the contractor is scheduled for 4 November 1971.

(C) Also, two AGC/FLIRS (AN/AAQ-5) were modified with rear displays and were deployed to USARV for a Mine Detection evaluation by ACTIV. The modified rear view displays permitted observers to assist in the search for mines. The decision to deploy was based upon favorable results from MERDC tests which had been conducted during this period. At the conclusion of the ACTIV evaluation, USARV recommended continuation of operational use and further evaluation for Mine Detection. The systems are being returned.

Special Projects

Project Delight

(C) The US Navy desired to facilitate the detection of marine objects under conditions of inclement weather and darkness. There was also an urgent problem in ship collision-avoidance. The PM-NV Office supplied certain naval elements with the INFANT system, the NOD, and the Night Hawk for evaluation. The results have been very favorable and it is expected that the Navy will utilize some of the systems in the future.

Project Chop-Chop

(C) Project Chop-Chop is a classified Navy funded project. The PM-NV is furnishing night vision systems and support for a 90-day operation. Systems and aircraft have arrived at destination and

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training commenced 6 September 1971. The project is on schedule and the progress has been outstanding.

Night Vision for Other Weapons Systems and Uses

1. (U) In Fiscal Year 71 the PM-NV participated in the review and development of requirements for application of night vision for the CHAPPARAL, TOW Missile, M60A1 Tank, and LOH New Initiatives.

2. (U) Night Vision equipment continues on loan through Federal Agencies for Life Science and Environmental Research as well as for direct use by the FBI, Washington, D. C. Police, and the CIA.

Program for Improved Cost Estimating (ICE) - Phase 3

(U) Participation by the PM Office in Phase Three of the Improved Cost Estimating (ICE) Program produced life cycle cost studies on six (6) systems: the Night Vision Goggles; the Second Generation Crew Served Weapons Sight; the Second Generation Small Starlight Scope; the Night Observation Device, Long Range (Thermal); the Aiming Light; and the 1 KW Searchlight. These studies were completed in November 1970 and forwarded through USAECOM to Comptroller, HQ USAMC, where they were approved to serve as baseline estimates for these systems.

Cost Avoidance

(U) Mean Time Between Failure (MTBF) of 2.2 KW Searchlight was increased from 75 hours to 220 hours, increasing reliability of performing an 8 hour mission from .894 to .964. The resulting cost avoidance for five years is estimated at \$2,325,000. This accomplishment was selected for publication in AMC Commander's Executive Summary of Reliability Improvements.

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STANO Field Support Group

Organization and Mission

(U) The US Army STANO Field Support Group, formerly the USAMC SEA NITEOPS Training, Test and Support Detachment, established by General Order #96, dated 30 September 1968, provides electronic maintenance training and aviation and logistical support of prototype STANO items throughout the world.

Transition Plan

Background

(FOUO) The PM-NV Office was officially established on 23 February 1965. The PM had continuing full line authority for centralized management of his specific project as outlined in his approved Charter dated 21 April 1970. The revised Charter dated 31 December 1970, as stated at the outset of this Report, had been submitted for approval; but because of the uncertainty of the PMO, no action was taken. This situation existed despite issuance of General Order #64 dated 1 April 1971 reorganizing the office of the PM-NV and incorporating the responsibilities of the Project Manager SEA NITEOPS and responsibility for the operation of the US Army STANO Field Support Group.

Reordered Priorities

(FOUO) Since the implementation of General Order #64, world conditions have changed. The deescalation of the war in RVN has markedly reduced the need for new night vision technology in support of that theatre. The priority and magnitude of remaining individual soldier and crew served weapon applications of night vision devices no longer support the need for a project manager. In view of the above, and since the

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items have reached a place in the life cycle whereby intensive, vertical management as prescribed under project manager criteria is no longer necessary, the PM-NV by letter, AMCEM-NV, dated 6 August 1971, subject: Transition Plan, recommended disestablishment of the OPM-NV. The CG, USAECOM forwarded the recommendation for disestablishment, together with the proposed transition plan, recommending approval to CG, USAMC. On 10 August 1971, the CG, USAMC in turn forwarded it to the OCR&D recommending approval. The disposition of personnel will be in accordance with Civilian Personnel Regulations pertinent to disestablishment of Project Managers' Offices as implemented by Headquarters, AMC CPO.

(FOUO) The functions of the STANO Field Support Group will be re-aligned as follows:

Aviation Division personnel and assets will be assigned to the Aviation Detachment Headquarters Installation Support Activity, ECOM, with duty station at Fort Belvoir; some of the remaining personnel will be reassigned to establish the Night Vision Support Office, Night Vision Laboratory, ECOM, Fort Belvoir.

SATCOM (US Army Satellite Communications Agency)*

Background

(U) The US Army Satellite Communications (SATCOM) Agency, as Army Project Manager for satellite communications, was responsible for providing the ground environment for the Department of Defense satellite communications system. The SATCOM Project Manager also acts as the Army's agent for all international military satellite communications systems and represents the Army in special Department of Defense

*The material in this portion was submitted by the Project Manager, SATCOM

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satellite projects not specifically communications. In addition, the SATCOM Project Manager exercises complete life-cycle responsibility for the military satellite communications ground environment which are tri-service operated and some of which have international implications.

(U) The Agency was an integrated facility for engineering, research and development, testing and evaluation, and systems operations. From its headquarters at Fort Monmouth, N. J., the Agency directed the operations of a field station at Lakehurst (N. J.) Naval Air Station which was used as the staging and testing area for tactical satellite communications for SATCOM's global commitments.

Major Accomplishments

(U) Major advances in Phase II of the Defense Satellite Communications Program, and in the development of small tactical satellite communications terminals marked Fiscal Year 1971 at the Army Satellite Communications (SATCOM) Agency.

(U) In Palo Alto, California, the 60-foot reflector assembly of a Heavy Transportable Terminal was erected on the test site of Philco-Ford's Western Development Laboratories. The terminal is being designed and fabricated under Contract No. DAABO7-70-C-0234 awarded to Philco-Ford 10 June 1970 for one Heavy Transportable Terminal and one Medium Transportable Terminal in the Phase II program.

(U) Fabrication of the Medium Transportable Terminal's antenna pedestal and reflector assembly was completed and preliminary testing of ancillary equipment for both terminals was successfully carried out. The terminals are scheduled for delivery during the 2d Quarter of CY 1972.

(U) In the first half of Fiscal Year 1971, the practicability of satellite communications terminals aboard Army aircraft was demonstrated through a test program involving both ultrahigh frequency (UHF) and superhigh frequency (SHF) TACSAT terminals installed in UH-1D helicopters. As a result of this test program, it was determined that a UHF half-duplex voice satellite radio would be feasible using only a fraction of the equipment provided in the test model.

(U) When satellite equipment functions and performance requirements were analyzed, it was found that a large portion of required equipment was already, or soon available, aboard Army aircraft in the form of the AN/ARC-116 UHF radio. Satellite operation, however, requires some modifications, primarily the addition of a frequency modulation (FM) modulator and demodulator and a special antenna. Such a modified radio could perform both the normal UHF line-of-sight and satellite functions. During this testing, an SHF voice circuit was established between a helicopter flying over Lakehurst, N. J., and an Air Force EC-135 aircraft in flight over Australia.

(U) A major technical advance which made the satellite mode practical for helicopters is the unique antenna system mounted above the rotor. In this position, the rotating blades do not block the signals' path to and from the helicopter.

Defense Satellite Communications System (DSCS)

(U) In conformance with Defense Communications Agency (DCA) direction to provide a smooth operational transition for the Phase I to Phase II of the Defense Satellite Communications System, interim Stages 1a and 1b of Phase II call for the development of communications

subsystems and earth terminal modification to accommodate these subsystems. Because of the many interrelated and interacting subsystems involved in this modification program, SATCOM Agency prepared a DSCS Phase II Ground System Plan to outline the development, deployment, maintenance, test evaluation and control concept for the ground environment of the Phase II system. The plan addresses all these areas in detail and is useful both as a development plan and a system description of States 1a and 1b of Phase II. The Agency will prepare an extension of the plan covering State 2 of Phase II at the appropriate future date.

(U) On 27 April 1971, Contract No. DAAB07-71-C-0224 for \$5.57 million was awarded to Philco-Ford for the design and fabrication of 14 Contingency Communication Subsystems, 8 Nodal Communications Subsystems and 7 Non-Nodal Communication Subsystems. These subsystems are the modulation portion of a satellite earth terminal and will interface with users of conventional military systems, either direct or through a Defense Communications System Technical Control Facility in Stage 1b, Phase II DSCS.

(U) The Contingency Communications Subsystem will be a shelter configuration deployed as part of the AN/TSC-54 earth terminal. The terminal will be capable of providing 12 voice channels or 11 voice channels and 16 teletype channels and interface with the microwave portion of the earth terminal at 70 megahertz. This subsystem provides the necessary modem and multiplex equipment to support up to 7 satellite communication links simultaneously to non-nodal terminals through a single satellite repeater. The Nodal Communications Subsystem

interfaces with the microwave portion of the earth terminal at 70 mhz and with the user via a Technical Control Facility.

(U) The non-nodal subsystem consists of a kit for the modification and upgrading of the Armadillo multiplex shelter and OCV portions of the AN/MS-46 earth terminal. The non-nodal system provides a 12-channel voice capability expandable to 24 channels.

(U) To meet an urgent Defense Communications Agency requirement to provide a 12-channel contingency capability at the time of the initial launching of the Phase II satellite, SATCOM Agency undertook the in-house design and fabrication of two Interim Contingency Communication Satellite Subsystems. These subsystems will be used as part of the AN/TSC-54 terminal until delivery of replacement units being developed by Philco-Ford under Contract No. DAAB07-71-C-0224. All the logistics and provisioning items such as spare parts, technical manuals, and programs of instruction are being prepared in-house.

(U) Design, fabrication and system integration were completed in the AN/USC-28() Advanced Development program. The program's objective is the development of an advanced spread spectrum modulation-demodulation communications equipment for use in the earth terminals for increased anti-jamming protection with the Phase II, DSCS high power satellites.

(U) A concept for the communications control of the operation of the DSCS Phase II system was developed. The concept is based upon providing maximum operating reserve in the satellite so that reserve power can be assigned to links having difficulties. The heart of the system is an automatic, digitally controlled, quantitative spectrum

analyzer associated with a major terminal in each area of satellite coverage, which measures the satellite down link power and frequency distribution and compares these parameters with authorized values. The procurement of an evaluation model was initiated.

(U) A system concept was developed for Time Division Multiple Access applicable to the latter stages of the Phase II satellite of the DSCS. This concept establishes the techniques, system parameters, and operational plan for highly efficient time sharing of the satellite by a multitude of ground terminals handling all digital traffic. It allows for the flexible and efficient multiple access to the satellite without the severe problems of transmitter power control normal to the present Frequency Division Multiple Access systems now in use and to be continued in the early stages of Phase II.

(U) A multichannel wide-band secure voice trunking capability between Autosevocom switches in the Pentagon and Hawaii was installed during June. The system, called Muscle Trunk, allows wide-band, high quality trunking among secure subscribers of widely separated switches, eliminating the earlier standard narrow-band trunking which required vocoder operation. This system, on an interim basis, time shares the Phase I DSCS link with Compass Link. It includes two wide-band secure trunks and two clear voice links. The Agency provided wide-band communications circuits, test equipment and technical personnel to conduct tests and establish criteria for Muscle Trunk.

(U) A Terminal Equipment Test Facility (TETF) at SATCOM Agency headquarters is a major component of the SATCOM Ground Subsystem Evaluation Facility (GSEF). The AN/MSC-46, Serial No. 8; AN/TSC-54,

Serial No. 2; Lincoln Experimental Terminal (LET), and related support facilities known as the Engineering Test Facility (ETF), located behind SATCOM headquarters complete the GSEF make-up.

(U) The TETF is an engineering test complex comprised of various modems, multiplex, converter, power, test and data acquisition equipment. The TETF and the various terminals interconnected by low loss coaxial cables, multipair telephone cables and instrumentation cables provide a cohesive and versatile test facility capable of supporting satellite system performance tests and terminal and/or modem testing either independently or in concert.

(U) The performance of subsystems such as multiplexers, modulators, demodulators and other equipment can be quickly determined in the Terminal Equipment Test Facility and the Systems Evaluation Network.

(U) Complete foundation drawings for the AN/MSC-46 and AN/TSC-54 terminals' rigid radomes were provided to the US Army Strategic Communications Command for Landstuhl, Germany; Asmara, Ethiopia; Ba Queo and Nha Trang, Vietnam; and Seoul, Korea; to the Navy for Guantanamo Bay, Cuba, and Norfolk, Virginia; and to the US Army Signal Center and School at Fort Monmouth. The SATCOM Agency also served as consultant to the Army, Navy, Air Force and the North Atlantic Treaty Organization on site preparation and installation of satellite communications earth terminals.

(U) During the course of the fiscal year, there was a total of 123 Engineering Test Facility tasks established. Of these, 112 tasks involved field change bulletin kit trials, maintenance bulletin verifications, systems tests and special projects of which 72 were assigned

to the AN/MSC-46 and 40 to the AN/TSC-54. There were three tasks involving MSC-46 and TSC-54 interoperability. Eight miscellaneous tasks did not involve either terminal.

(U) There were 16 on-site technical visits by SATCOM Agency and/or contractor personnel to deployed MSC-46 and TSC-54 terminals for various problems beyond the capability of site personnel to resolve.

(U) Agency personnel assisted in site surveys for satellite communications earth terminals at Fort Dix, New Jersey; Fort Ritchie, Sharpsburg, and Fort Detrick, Maryland; Helemano, Hawaii; Fingayen, Guam; Stuttgart, Vaihingen and Boeblingen, Germany; Londonderry, Ireland; and Rota, Spain.

(U) The SATCOM Agency supported more than 47 operational satellite communications terminals throughout the world and a multitude of development engineering systems. Operating terminals include the AN/MSC-46, AN/TSC-54 and SHF and UHF tactical satellite communications terminals. Developmental systems include spread spectrum equipment AN/URC-55 and AN/URC-61.

(U) Spread spectrum equipment, specifically, AN/URC-55, AN/URC-61 and AN/URC-61X was developed and supported by Magnavox Research Laboratories through SATCOM Agency controlled, contractor operated depot supply and repair facilities.

(U) SATCOM Agency satisfied Army Materiel Command Integrated Logistics Support (ILS) requirements as applicable to the Agency, initiating a specialized ILS concept tailored specifically for the Defense Satellite Communications System. These requirements made up a specific task under PROMAP-70 which was completed in December 1970.

(U) The Agency sought and obtained DCA approval for the multi-million-dollar, three-year contractual effort to provide a variety of ILS documentation and specialized technical services. SATCOM Agency prepared the Statement of Work and allied procurement data for initiation of the contract in early fiscal year 1972. As a result, a major procurement action is in progress for documentation. This will include earth terminal complex level support documentation and logistic support system analysis.

Tactical Satellite Communications (TACSATCOM) Program

(U) On 1 July 1970, the Tactical Satellite Communications (TACSATCOM) program officially completed the R&D phase and entered an Interim Operational Capability (IOC) period as set forth by the Secretary of Defense in 1966. The IOC period for TACSATCOM is intended to provide maximum utilization for the unique and versatile tactical satellite terminals and to obtain field experience for follow-on efforts.

(U) The first major field exercise in which the TACSATCOM terminals were deployed was in the late summer of 1970 when a tactical satellite communications team and equipment from the SATCOM Agency was airlifted from Fort Riley, Kansas, to Germany to participate in the North Atlantic Treaty Organization training exercise Reforger II. The team was among more than 11,000 US-based troops taking part in the exercise.

(U) Deployed with the team were two teampack terminals, two jeep-mounted terminals and a terminal installed in a shelter on a 1½-ton vehicle. A five-man team and a shelter-mounted terminal

remained at Fort Riley.

(U) The team in Germany provided communications between field headquarters and 1st Division headquarters at Fort Riley, as well as between field headquarters and subordinate elements participating in the exercise.

(U) Following the Reforger II exercise, the terminals and team remained in Europe and conducted a number of demonstrations intended to bring this new communications technique to the attention of commanders and communications personnel.

(U) In August 1970, a milestone was marked in the history of tactical satellite communications when a teampack terminal was air-dropped for the first time by members of the 50th Signal Battalion (Airborne Corps) at Fort Bragg, North Carolina.

(U) Carrying the equipment, the paratroopers leaped from an aircraft at 1,500 feet, landing in a simulated combat area. Thirteen minutes from the time the jumpers left the aircraft, the first signal was beamed skyward to a satellite designated TACSAT I. The signal then was relayed by satellite to a ground station at SATCOM headquarters.

(U) In September of 1970, tactical satellite communications equipment was used for the first time in support of a presidential trip. The occasion was President Nixon's visit to Yugoslavia when the SATCOM Agency was tasked to back up the White House Communications Agency's TACSAT terminal.

(U) The AN/TRC-157 1½ ton shelter with teletype and voice capability that has been designated for emergency-contingency missions by

the Joint Chiefs of Staff, was airlifted to Yugoslavia from Andrews Air Force Base on 21 September 1970. The terminal was accompanied by a four-man SATCOM Agency team.

(U) On 22 September, the terminal was set up with the voice circuit extended to the White House Communications Agency switchboard in Zagreb. Although teletype was available, it was not extended.

(U) Another major achievement in the art of tactical satellite communications was recorded in January 1971 with the microwave radio linkup of two aircraft in flight--one over Lakehurst, NJ, the other over Australia.

(U) The two-way voice contact was between an Army helicopter over Lakehurst Naval Air Station, and an Air Force EC-135 aircraft near Sydney. The SHF hookup was effected through the TACSAT 1 satellite. The linkup demonstrated the ability of a satellite relay to extend to thousands of miles the normal 50-mile range of reliable microwave communications.

(U) The feat was made possible by a unique antenna system for helicopters developed under a joint program of the Army and Air Force. A high-gain tracking antenna, under a protective cover, is mounted atop the rotor of the helicopter to obtain a path to the satellite unobstructed by the rotating blades. Electronic equipment is mounted in a console inside the helicopter and only one operator is required.

(U) The SATCOM Agency has been engaged in testing the feasibility of the helicopter antenna and equipment to meet a need for dependable, long distance communications.

(U) A SATCOM Agency team had an impressive role in the Apollo 14 mission as part of a highly coordinated, worldwide communications and tracking system.

(U) Exercise Freedom Vault, a readiness test conducted by the 82d Airborne Division in the Republic of Korea, saw a SATCOM Agency tactical satellite communications team airlifted to Korea to establish communications between elements of the 82d in the field and division headquarters in Fort Bragg, North Carolina.

(U) The force was flown in aircraft of the Air Force Military Airlift Command to a sparsely populated location well south of the Korean Demilitarized zone, where it was airdropped into the designated exercise area.

(U) SATCOM Agency committed to the exercise two ultrahigh frequency team pack terminals and a terminal mounted on a $\frac{1}{2}$ -ton vehicle. Two Agency soldiers with a $\frac{1}{2}$ -ton vehicle-mounted terminal at Fort Lewis, Washington, also took part in the exercise.

(U) In a very real sense 1971 marks a new era in tactical satellite communications. The Army has completed major studies into the terminal parameters and cost effectiveness of the TACSATCOM Program.

(U) As a result of these studies and approval at Army staff level of the coordinated TACSATCOM Qualitative Materiel Requirement, SATCOM Agency has developed complete specifications and launched the operational system for implementation in the 1975 time frame. Within guidelines set forth in the Development Concept Paper, it is envisioned that standardized $1\frac{1}{2}$ -ton shelter terminals will begin to be fielded in calendar year 1976, with gradual buildup of quantities of these and

the remaining terminal types reaching a peak in the 1980 time frame. The multichannel terminals will be designed to operate with the Phase II DSCP satellites as well as with other defense satellites which will evolve from the Department of Defense program.

(U) SATCOM Agency is the Army's field agent in the North Atlantic Treaty Organization (NATO) research and development program in tactical satellite communications. The participants are Belgium, Canada, Federal Republic of Germany, Italy, The Netherlands, Norway, the United Kingdom, the United States and the Technical Centre of Supreme Headquarters, Allied Powers Europe. The NATO TACSATCOM program continued the use of the Lincoln Experimental Satellite (LES-6). Emphasis was on the development of airborne and miniaturized, transportable terminals. Terminals of participating nations have taken part in various NATO exercises with notable success. It is anticipated that this program will continue, at least through the next fiscal year.

(U) SATCOM Agency is investigating Communications in Motion, a project to demonstrate tactical communications via satellite from a moving Army vehicle. A 1½ ton vehicle terminal type antenna was gyrostabilized and mounted on an M37B 3/4 ton field vehicle under a fiberglass shelter (radome).

(U) For the first half of the fiscal year, supply and maintenance support for the SHF TACSATCOM AN/TRR-30, AN/TSC-79, AN/MS-57, AN/TSC-BD and AN/ASC-14 was provided by Radio Corporation of America, Camden, the contractor depot. In December 1970, logistical support for SHF TACSATCOM was transferred from the contractor depot to Lexington-Blue Grass Army Depot, Lexington, Kentucky. The transfer of assets began

21 December and was completed 30 December. The Lexington depot began the full support to field terminals on 4 January 1971. All depot supply and maintenance support for SHF TACSATCOM now is provided by the Lexington depot.

Defense Navigation Satellite System

(U) A revised "Development Plan for the Army Portion of the Defense Navigation Satellite System (DNSS)" was issued 19 February 1971. The plan describes the program and activities to be carried out during the Army's Concept Formulation Phase (CFP) for the joint-service DNSS.

(U) A Qualitative Materiel Approach (QMA) for "Positioning, Navigation and Survey by Means of Navigation Satellites" was prepared and forwarded to Army Materiel Command on 14 September 1970. This QMA discusses the feasibility of navigation satellites meeting Army positioning, navigation and survey requirements. It recommends a technical approach to exploit this technique to satisfy several operational capability objectives and qualitative materiel development objectives. US Army Combat Developments Command concurred in the QMA and recommended DNSS for the second generation system.

(U) In February 1971, a final report was rendered by Cornell Aeronautical Laboratory on the result of a study indicating that DNSS can improve operational capabilities by providing three-dimensional position fixes quickly. This can be done under all weather conditions and is relatively independent of terrain obstacles and enemy actions. The study was conducted under a contract awarded 27 June 1970.

(U) SATCOM Agency has funded a task with Grumman, through the Air Force, to plan and propose additional field tests of a single-channel receiver, which is typical of the ones the Army will employ in helicopters and ground vehicles. Contingent upon availability of funds, plans call for these Army tests to be added to the Air Force program.

US Army Communications Systems Agency
STARCOM (Strategic Army Communications)

Introduction

(U) On 1 March 1967, the US Army Communications Systems Agency (USACSA), a joint US Army Materiel Command (USAMC) and US Army Strategic Communications Command (USASTRATCOM) Project Management Agency, was
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activated at Fort Monmouth, New Jersey. The Commanding General, USASTRATCOM, on behalf of USAMC and USASTRATCOM organized the new agency as a USASTRATCOM command and by mutual agreement of the two commands, the Commanding Officer, USACSA was assigned to USASTRATCOM for duty as Commanding Officer, USACSA, and appointed as the USAMC
51
Project Manager for Strategic Army Communications (STARCOM) projects.

(U) The US Army Communications Systems Agency was organized for the centralized management of Defense Communications System (DCS) and
52
Strategic Army Communications (STARCOM) projects and tasks as assigned.

50

Ltr, TAG to CG, USAMC and CG, USASTRATCOM, 15 Feb 67, subject: Establishment of a joint USAMC/USASTRATCOM Project Management Agency.

51

Headquarters, USAMC and Headquarters USASTRATCOM, 28 Feb 67, Subject: Charter.

52

DA Message No. 801463 for DA-CCE to DCA, 14 Feb 67, subject: Army Plans for Management of the AUTODIN Program.

Specifically, the primary functions of the new Agency were to be the technical and business management of engineering, procurement, production, distribution, and follow-on logistic and maintenance support for assigned projects. Research and development projects, as assigned,⁵³ were also to be managed by the Agency. The mission of the US Army Communications Systems Agency is to manage the development and acquisition (research, engineering, procurement, production, distribution, installation, and integrated logistical support) of projects assigned⁵⁴ by the Commanding Generals, USAMC and USASTRATCOM.

Command

(U) On 30 June 1970, Colonel William D. Canfield, 709-10-2492, Signal Corps, who had served as commander of the Agency and as Project Manager, STARCOM from 14 August 1969 was assigned to the USAECOM Separation Processing Activity preparatory to his retirement from the⁵⁵ Army. Effective 3 August 1970, Colonel (P) Richard W. Swenson, 285-18-8834, Signal Corps, was designated Project Manager, STARCOM and⁵⁶ Commanding Officer of the Agency. Subsequently, on 1 March 1971,⁵⁷ Colonel Swenson was promoted to the rank of Brigadier General.

⁵³

Ibid.

⁵⁴

Ltr, Headquarters, USAMC and Headquarters, USASTRATCOM, Subject: Charter, dated 28 February 1967. p. 2

⁵⁵

Special Orders No. 42 Headquarters, USASCS, Ft Monmouth, NJ, 18 Jun 70.

⁵⁶

(a)(U) Message 044704 Headquarters, USAMC, subject: Designation of Project Managers, 15 Jul 70.

(b) GO No. 22, Headquarters USACSA, Ft Monmouth, NJ, 3 Aug 70.

⁵⁷

Special Orders No. 35, Headquarters, Department of the Army, Washington, D. C., 22 Feb 71.

(U) On 6 July 1971 Brigadier General Dorward W. Ogden, Jr.,⁵⁸
134-16-3768 was designated Project Manager STARCOM⁵⁹ and Commanding
General, USACSA Vice Brigadier General Swenson who was reassigned⁶⁰
as Deputy Commanding General, US Army Electronics Command.

(U) The USACSA - STARCOM Project has several functional and operational aspects that are both distinct and complex. It is substantially different from the conventional approach to project management in that there is no single end item which the total work effort of the Agency is directed. The management responsibilities assigned to USACSA - STARCOM Project include long-range, worldwide communications for the ultimate operation jointly by the Army, Navy, and Air Force under the direction of the Defense Communications Agency (DCA). The USACSA - STARCOM Project also manages tasks and projects that relate to purely Army requirements, to requirements for other US military departments and non-military US Government Agencies, as well as requirements for allied armies and governments.

(U) A wide range and variety of individual communications-electronics materiel are also procured for follow-on logistical support for over 4,200 distinct PEMA items unique to Strategic Communications **are** involved. There are also communication systems being engineered and installed under contract with industry such as the Integrated Joint

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(U) Message 131757Z Jul 71, Headquarters, USAMC, Subject: Designation of Proj. Manager, Strategic Army Communications (STARCOM).

59

General Orders No. 9 Headquarters USACSA, Ft Monmouth, NJ dtd 6 Jul 71.

60

Ibid.

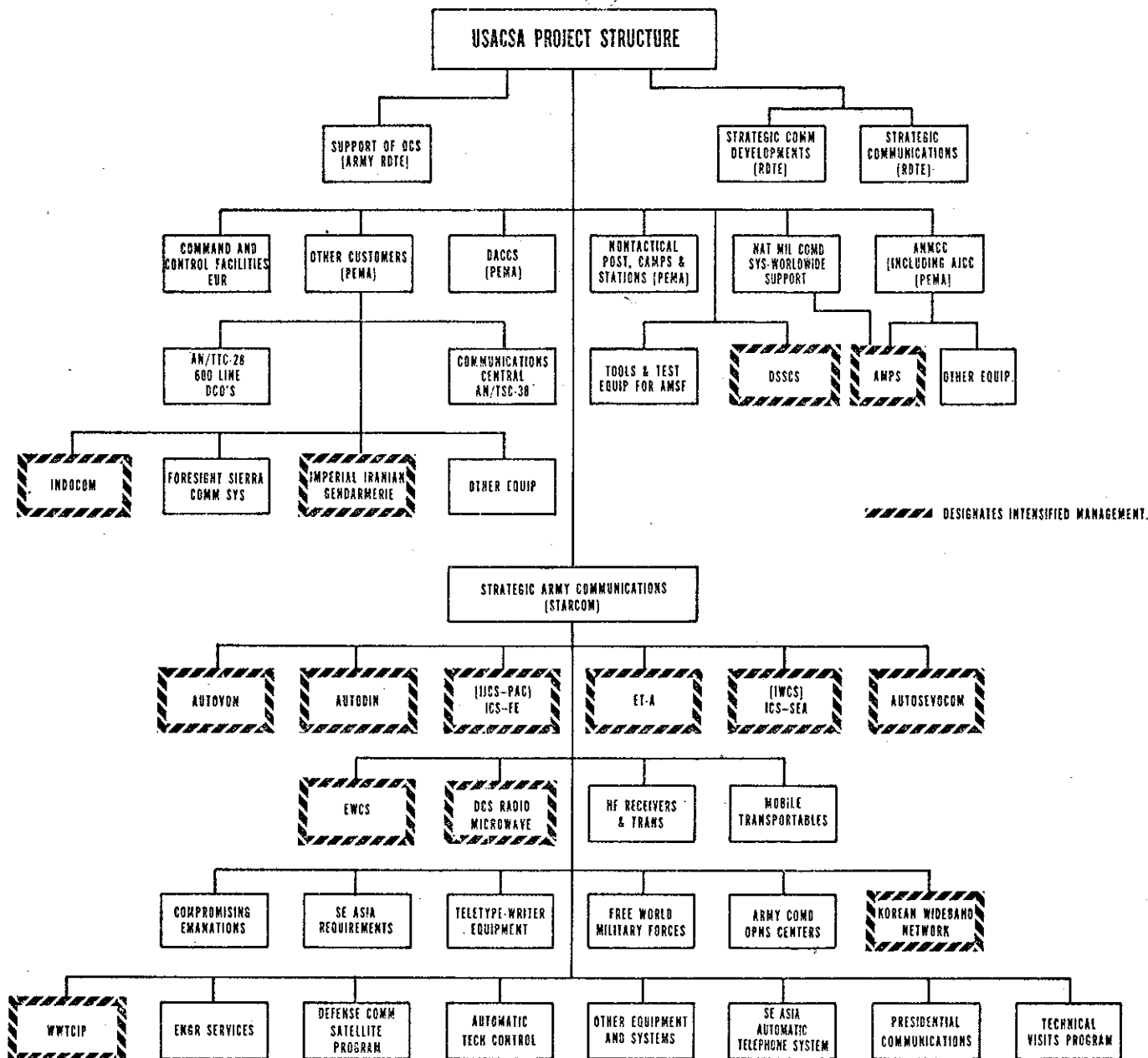
Communications System - Pacific and the European Wideband Communications System Selected Link Improvements for Fiscal Year 68, Fiscal Year 69, and Fiscal Year 70. The Agency's work efforts, include a global complex of inter/intra-country and continental microwave, cable, and tropospheric scatter facilities. Commercially developed equipments packaged in transportable configuration such as the Communications Central AN/TSC-38 are also procured and managed.

(U) Military Assistance Program (MAP) projects such as the Indonesian Communications System (INDOCOM) and the Foresight Sierra Communications System for the Republic of the Philippines are also under the procurement cognizance of the STARCOM Project Manager.

(U) An average of 115 active contracts with a value in excess of \$413 million were managed by the Project Manager in Fiscal Year 71. Figure 1 depicts the most logical arrangement of a substantial number of these diverse and unrelated systems and equipments that comprise the STARCOM Project.

(U) Project Management responsibility for certain research and development (R&D) projects and tasks has also been assigned to the USACSA-Project STARCOM commander. Among the R&D programs that have been assigned to the Project Manager are the Strategic Communications Developments (Advanced Speech Compression); Strategic Communications (Record Communications, High Speed Page Printer and Distributor Transmitter); and Support of DCS-Army (Transportable Recoverables, Centralize Automatic Message Entry and Addressal, and the Low Speed Digital Data Buffer). Also included in this category is a unique tasking that does not fit the pattern of the aforementioned tasks. Because of

FIGURE 3



certain critical National Defense Projects, this Agency has been tasked to provide the in-depth engineering and intensive management for the R&D of the Pulse Code Modulation Multiplexer TD-968()/U. The TD-968()/U will be an integral part of the Defense Satellite Communications System Phase II.

(U) There are two unusual conditions which complicate and restrict the Project Manager's technical and managerial efforts in the operation of the USACSA-STARCOM Project:

(U) The Project Manager does not determine the requirements for the STARCOM Procurement Equipment Missiles-Army (PEMA) systems and equipments which are established by USASTRATCOM, the DA Assistant Chief of Staff Communications-Electronics (ACSC-E), Defense Communications Agency (DCA), Joint Chiefs of Staff (JCS), Air Force, Navy, State Department, the White House, and others. Although the STARCOM Project Manager has been assigned R&D projects and tasks, he does not unilaterally effect major redirection of the technical approach on these R&D projects. This responsibility is shared by the Defense Director of Research and Engineering (DDR&E), DCA, ACSC-E, Office of the Chief, Research and Development (OCD), and others.

(U) Other factors that have had a pronounced influence on the Agency's method of doing business are certain characteristics inherent in STARCOM projects. Indicative of these definite restrictive influence are the following:

(U) The acquisition of strategic communications systems are funded by PEMA money and are to satisfy immediate operational requirements. There is no R&D cycle for the strategic communications systems

that are procured by this Agency;

(U) The systems equipment configurations are not standard and differ in each major strategic communications system assigned to the STARCOM Project for intensified management. These configurations are comprised of commercial equipment manufactured to meet a specific performance characteristic. This has led to a proliferation of equipment in the field and the establishment of a broad logistical support base with all its attendant problems;

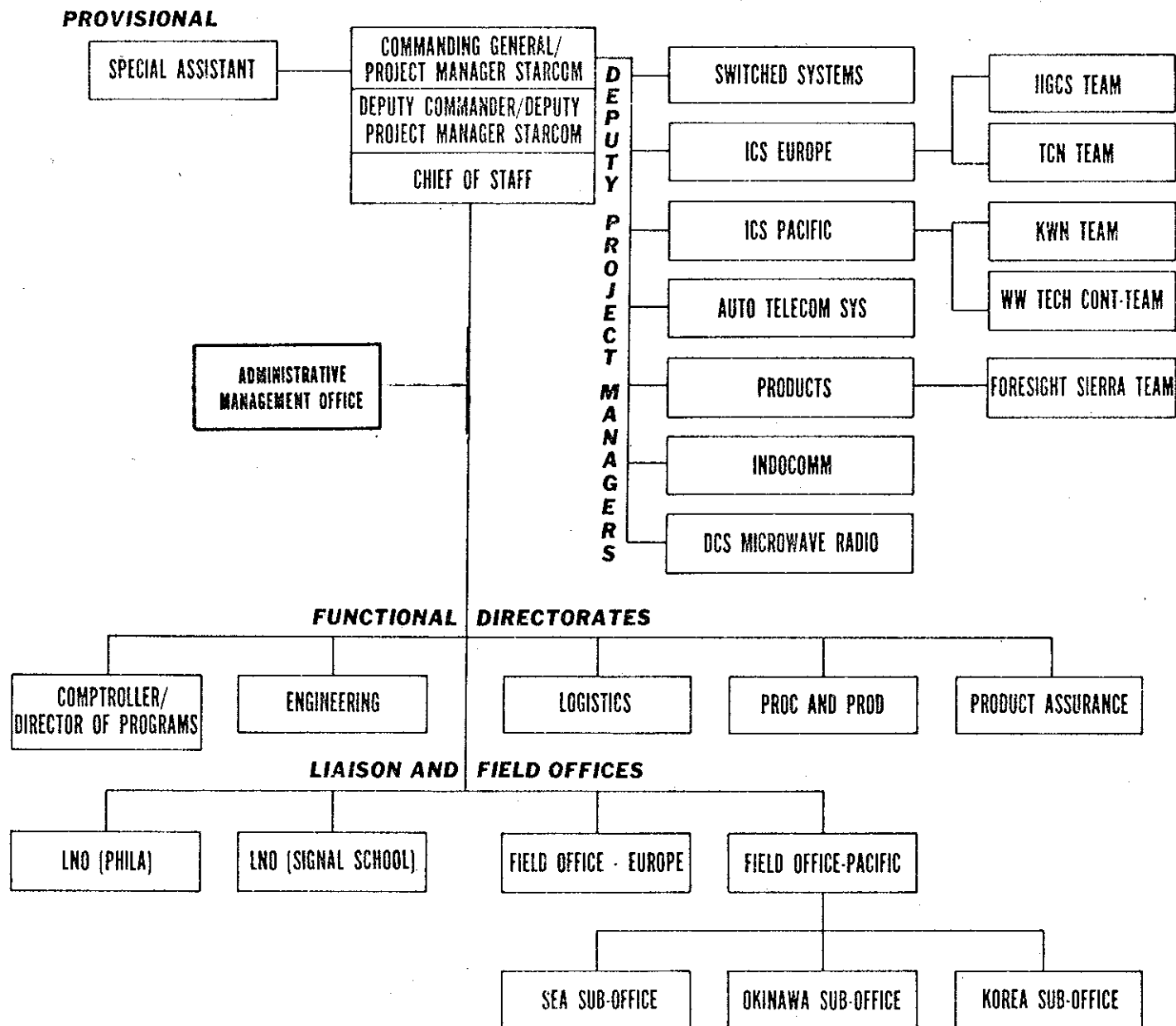
(U) The STARCOM cycle begins with the acquisition phase which results in a compressed management operation. Consequently, in the STARCOM cycle, equipment production is done at the same time that provisioning and software actions are underway. In most cases, the equipment is installed and operating before the support actions are completed. This has resulted in the interim use of contractor assistance in the form of operation and maintenance services, commercial manuals and parts lists, and spare parts kits.

(U) All Defense Communications Agency (DCA) tasks that are subsequently assigned to USACSA Project STARCOM are channeled through the Department of the Army and USASTRATCOM to the Agency. The tasking of non-DCS projects, however, is initiated at the Department of the Army level and directed through USASTRATCOM to the STARCOM Project Manager. As noted previously, the Project Manager executes these Agency mission assignments with the full line-authority of the Commanding General, USAMC and the Commanding General, USASTRATCOM.

(U) Figure 2 depicts the USACSA-Project STARCOM organization structure as it appeared at the close of business on 30 June 1971.

FIGURE 4

U. S. ARMY COMMUNICATIONS SYSTEMS AGENCY/PROJECT MANAGER STARCOM



With the exception of the seven offices of the Deputy Project Managers, the Agency is structured in a conventional management organization pattern. The Deputy Project Managers provide intensified management to selected systems and projects and their offices are staffed with engineering and support personnel commensurate with the requirements of the individual projects. The functional directorates, in addition to their regular assignments, provide specific support to the Deputy Project Managers, as required.

(U) At the start of business on 1 July 1970 the combined authorized and assigned military and civilian personnel strength of the USACSA-STARCOM Project was as follows:

USACSA Authorized Personnel Spaces

	<u>Officers</u>	<u>Enlisted</u>	<u>Civilian</u>	<u>Total</u>
USAMC	14	7	130	151
USASTRATCOM	<u>16</u>	<u>29</u>	<u>70*</u>	<u>115</u>
TOTAL	30	36	200	266

*Overhire authority for 23 civilians not included.

USACSA Actual Personnel Strength

	<u>Officers</u>	<u>Enlisted</u>	<u>Civilian</u>	<u>Total</u>
USAMC	9	3	115	127
USASTRATCOM	<u>8</u>	<u>32</u>	<u>68</u>	<u>108</u>
TOTAL	17	35	183	235

Significant Accomplishments and Highlights In FY-71

(U) On 30 June 1971 over 65 major active systems and projects were assigned to STARCOM. As noted previously, one of the complex operational aspects of USACSA-Project STARCOM is the fact that no

single end item or major communications system is the goal toward which the total work effort of the Agency is directed. Rather, as a system or project is completed insofar as intensified project management is concerned, invariably, another new task is assigned to the Project Manager. So it was in Fiscal Year 71. During the past year, a number of projects and systems that had been assigned to USACSA-Project STARCOM in previous years were successfully completed and no longer required specialized intensive management. The following are the principal systems and projects that were completed in the past year:

Automatic Message Processing System (AMPS)

(U) During the fourth quarter, Fiscal Year 63, the Project Manager was assigned the responsibility for providing new equipments and systems to improve the communications capability of the Alternate National Military Control Center (ANMCC). The requirements consisted of an Automatic Message Processing System (AMPS) and a universal 4-wire cordless switchboard for the Alternate Joint Communications Center (AJCC) and miscellaneous equipment for the ANMCC. The switchboard was delivered to the government at the end of the fourth quarter, Fiscal Year 67.

(U) AMPS is a secure computerized electronic message processing system that supports the JCS and the National Command authority. It has two interconnected processors, one at the Pentagon and one at Fort Ritchie, Maryland, with multiple subscribers at both locations. The system also interconnects with AUTODIN for worldwide service. The AMPS was implemented in two phases: Phase I consisted of one non-duplicated message processor and a limited number of subscriber

equipment and message displays; Phase II expanded the Phase I processor to its fully duplicated capability, provided additional subscriber equipment, message displays, and an expanded message storage capability.

(U) On 6 June 1963, the Burroughs Corporation was awarded a contract for \$2.9 million Phase I. Feasibility tests on AMPS equipment were completed during February 1965; installation of equipment at the AJCC, Fort Ritchie, Maryland, began on 5 April 1965 and was completed in December 1965. A letter contract for Phase II was definitized with Burroughs Corporation on 1 March 1967 for \$4.637 million with provision for ceiling limitation up to \$5.017 million. AMPS Phase II hardware was accepted by the Government on 15 June 1968. During the first quarter Fiscal Year 69 the software program for AMPS Phase II was developed by the contractor and the system acceptance testing began. On 23 March 1970, the system testing was completed and the AMPS was accepted by the government at both Ritchie and the Pentagon. At that time, the operational control of the system was turned over to the JCS.

The Army Operations Center (AOC)

(U) The Army Operations Center, located in the Pentagon, provides the Department of the Army with a new central command center. It also serves in a dual capacity as a control center for the Directorate for Civil Disturbances Planning and Operations (DCPPD).

(U) The AOC is comprised of two major systems, the audiovisual and the closed-circuit television (CCTV). These systems provide center users the following monitoring capabilities: large scale graphic displays, remote TV displays through the CCTV, video taping facility,

complete intercom and commercial telephone services, and integrated sound reinforcement.

(U) In August 1969 two firm fixed-priced contracts were awarded, one to Hoppman Corporation for the audiovisual system in the amount of \$367,000, and the other to Ampex Corporation in the amount of \$192,000 for the CCTV system. Both contractors completed installation and training during January 1970. In the interim, USACSA-Project STARCOM continued to monitor the establishment of a maintenance support capability to be accomplished by the National Communications Command (NCC). Support arrangements were essentially completed in April 1971 and STARCOM ceased its managerial surveillance.

EUCOM Command Center

(U) During Fiscal Year 67, under Project FRELOC, Headquarters USEUCOM was relocated from Camp des Loges, France, to Patch Barracks, Stuttgart, Federal Republic of Germany. Accordingly, the command center was installed at interim facilities pending completion of a new military construction appropriation building. On 19 May 1967, DA letter outlined approved communications-electronics requirements for the new command center and assigned responsibilities for implementation thereof. The EUCOM Command Center would provide the Command and Control communications-electronics subsystem (command and control facilities) associated with the development of the new EUCOM Command Center in the Federal Republic of Germany.

(U) To provide the USCINCEUR a command and control capability, the following subsystems were installed in the new command center: Secure Voice, Non-secure recording and playback, Graphics and briefing

facilities, Sound amplification and distribution, Display, Teletype and data communications, and Non-secure voice subsystem.

(U) On 25 September 1967, a letter was issued to Western Electric Company (WECO) to engineer, furnish, and install the Non-Secure Voice Subsystem. The contract was definitized in June 1968, and on 25 October 1968 the Non-Secure Voice Subsystem was accepted by Government. Contractor life-cycle support is DA's stated policy for this system due to the factors of complexity, uniqueness, and extraordinary high costs associated with providing a logistical support base. During Fiscal Year 71, USACSA-Project STARCOM procured for USASTRATCOM-EUR operation and maintenance (O&M) services for the Non-Secure Voice Subsystem. The services were performed by WECO at a cost of \$478,000. On 6 November 1967 a letter contract was awarded to Page Communications Engineers (PCE) to engineer, furnish, and install the remaining communications-electronics (C-E) subsystems. The contract was definitized on 2 April 1968. Additional contract modifications requested by the Government were definitized on 28 June 1968.

(U) The new command center was formally dedicated on 6 November 1968; all C-E subsystems were operational and accepted by the government with certain exceptions. The contractor (PCE) corrected the bulk of these exceptions during the third quarter Fiscal Year 69. The currently approved DA Logistic Support Plan (LSP) policy for the C-E subsystem is to provide a contractor-military mix for O&M of these subsystems. Accordingly, this Agency procures for USASTRATCOM-EUR on a competitive basis, annual O&M services. The current contract is with Lockheed Electronics for \$60,153.

(U) As a result of specific direction from DA and Headquarters USASTRATCOM, the Project Manager issued a letter contract on 22 November 1967 to Melpar, Inc. to engineer, furnish, and install a surveillance system for the hardened cable path at the EUCOM Command Center. The letter contract was definitized on 12 February 1968. Melpar installation effort commenced on 15 April 1968 and was completed during May 1968. The contractor failed to provide an acceptable calibrated surveillance system. Consequently, on 13 August 1968 the Procuring Contracting Officer (PCO) sent a show cause letter to the contractor. Subsequently, upon consultation with his legal advisor, the PCO made the determination that this "best efforts" type contract should be terminated for the convenience of the government. After an extended period of negotiation, the PCO and contractor arrived at a mutually agreeable termination charge and the contract was subsequently closed out during June 1970.

Integrated Wideband Communications System
Southeast Asia (IWCS-SEA)

(U) In August 1965, the responsibility for the procurement of services and material--engineer, furnish, and install--for the IWCS-SEA was assigned to the Project Manager UNICOM/STARCOM Project. Subsequently, when USACSA-Project STARCOM was organized on 1 March 1967 the responsibility was assigned to the new Agency.

(U) The IWCS-SEA integrated the wideband resources of the Defense Communications System (DCS) in SE Asia. Included in the IWCS system are submarine cable, microwave, tropospheric scatter, satellite and high frequency radio circuits engineered into a network capable of

providing reliable communications 24 hour a day as a backbone or base system interconnecting all US forces in Southeast Asia. The system is operational in Thailand and the Republic of Vietnam.

New Tasks Assigned in Fiscal Year 71

DCS Microwave Radio

(U) In June 1970, the Commanding General, USASTRATCOM designated the Commanding General, USACSA-Project STARCOM as the Project Manager for the DCS Microwave Radio Program. The DCS Microwave Radio will provide a radio terminal set common to the three Military Departments. It will be a commercial set, line-of-sight, and operation in the 4 or 8 GHz band with 600 channels of information. It will be modified to satisfy certain military requirements.

(U) On 1 April 1971, technical proposals and verification models of the radio terminal were solicited from industry. Three proposals were received on 15 June 1971 and evaluated at this Agency by a tri-service team and personnel from DCA. All proposals were determined to be acceptable and each offeror was tendered a lease agreement for \$20,000 for 120 days of government testing of their verification models. Upon completion of testing, offerors whose models have passed evaluation and tests will be solicited for award of a production contract.

The Royal Thailand Army (RTA) Communications Network

(U) The RTA Communications Network will provide a direct and reliable voice communications network in the high-frequency (HF) range among four network control stations located at RTA Headquarters in Bangkok to 33 substations located throughout Thailand. Voice

Communication is attained by means of the single-sideband (SSB) type of modulation. The radio equipment has an expansion capability for future frequency-shift keying.

(U) On 12 March 1971, a Firm Fixed Price Contract for \$175,000 was awarded to Collins Radio Company for the radio equipment. A Firm Fixed Price Contract was awarded to Delta Electronics on 27 May 1971 in the amount of \$203,000 for the antenna system. This is a Military Assistance Program (MAP) project.

Alaskan Microwave Radio Improvement

(U) On 10 August 1970 the Commanding General, USASTRATCOM directed USACSA-Project STARCOM to procure services for improvements to the Alaskan Microwave Radio System, in support of the NIKE-Hercules Air Defense System, Anchorage, Alaska. These improvements were to include six dual frequency diversity microwave terminals, consisting of the AN/FRC-109(v)9 which will be fully integrated into an operational communications system. These terminals are replacements of existing obsolete radio terminals (Philco CLR-9) currently in operation within the USASTRATCOM Signal Group (Alaska) Microwave Communications System. Site installations are located at three NIKE Hercules firing batteries, one at USASTRATCOM-Alaska Headquarters in Fort Richardson, and one at a remote relay site at the southernmost area of Fort Richardson.

USACSA-Project STARCOM PEMA Program

(U) The prime resource of USACSA-Project STARCOM during Fiscal Year 71 was the Procurement Equipment Missiles-Army (PEMA) Program. The PEMA category encompasses the procurement of systems and a large cross-section of individual items required to develop or support

continental, overseas, and inter-command strategic communications-electronics facilities for Army and other customers.

(U) The initially released PEMA procurement program for Fiscal Year 71 was \$10.5 million; on 30 June 1971, the program was \$47.4 million. The combined all-years program, including the carry-on program (unobligated dollars from prior-year programs) totaled \$141.7 million by the end of Fiscal Year 71. During Fiscal Year 71, the Southeast Asia and other requirements for strategic communications in the Pacific decreased considerably. The procurements for Southeast Asia in Fiscal Year 71 consisted mainly of items and dollars programmed in prior years for the completion of the system.

(U) Following the trend of previous years, the STARCOM program experienced extensive changes in project funding as well as frequent changes in equipment requirements and selection. As a result of these changes and redirection of efforts, in current and prior years, the program underwent revisions which greatly affected procurement planning and rate of obligation.

(U) In Fiscal Year 71, the carry-on portion of the USACSA-Project STARCOM program totaled \$94.3 million broken out as follows:

(Dollars in Millions)

FY-66 & Prior	7.2
FY-67	3.3
FY-68	19.7
FY-69	25.2
FY-70	38.9

(U) By the end of Fiscal Year 71, \$49.3 million of the \$94.3 million had been awarded leaving a balance of \$45.0 million as prior-year carry on to Fiscal Year 72. The major part of the carry on reflects funds to support procurement of strategic communications systems in process of being acquired and not completed. The Fiscal Year 71 program of \$47.4 million includes \$21.6 million of other customer funds. The agency awarded \$13.2 million of the Fiscal Year 71 program including \$7.5 million of the customer program. The Fiscal Year 71 program carried on to Fiscal Year 72 is \$34.2 million which includes \$14.1 million of other customer funds. During Fiscal Year 71 USACSA personnel managed the procurements of 1,913 individual items, systems, or equipments. Total STARCOM awards and associated budget lines for Fiscal Year 71 totaled \$62.5 million.

Management Information System

(U) An integrated management information system (MIS) that would be practical, functional, and timely to the Agency's complex job operations was initiated at the beginning of Fiscal Year 71. Seven areas were determined to be critical to the requirements for this Agency's MIS. Those areas were Financial Management, Project/Systems Status, Contract Management, Quality Assurance, Logistics, Personnel, and Engineering Activities. A Prospectus for the Financial Management and Contract Status reporting system was developed in August 1970 and submitted to the USAECOM Priority Board for approval. The USAECOM Priority Board approved the USACSA Prospectus on 2 September 1971.

(U) Systems and computer programming personnel were provided by USAECOM to implement Phase I, Financial Management System in October

1971. The initial data base was developed and an automated data base was established in January 1971. The first segment of reports were produced in late February and were reviewed and revised to meet the original specifications. The principal elements of the system that were developed and functioning by the end of Fiscal Year 71 included reports that covered PEMA Program Status, Manpower Control, Systems-Projects Progress Summary, Pre-Award Procurement Package Status, and Definitization Schedule Status.

Management Information Center

(U) The concept for a USACSA-Project STARCOM Management Information Center that had been developed in previous years was realized with the establishment of a permanent center in Fiscal Year 71. Construction was begun late in Fiscal Year 70. Within this center, current status of major projects and systems, comptroller and program management information, as well as RDT&E and logistics data are available and displayed through illuminated visual aids. The Management Information Center facilities are also used to determine trends and potential problem areas, monitor significant contractual deliveries, develop statistical analyses, and provide data for in-house reviews of critical systems, projects, and tasks.

CHAPTER IV
RESEARCH, DEVELOPMENT AND ENGINEERING

Organization, Plans and Programs

(U) The RD&E Directorate in Fiscal Year 1971 conducted its overall activities in much the same manner as in Fiscal Year 1970. This meant continued cooperation with the outside scientific and technical community, implementation of advances in scientific and technical knowledge, improvement of methods in test and evaluation, modification of management systems and procedures, and provision of special support to SEA. It also meant continued management and supervision of all engineering programs of USAMC's major subordinate commands and project managers, as well as of assigned research and development responsibilities.

(U) In order to execute its responsibilities better, the directorate underwent a small reorganization in Fiscal Year 1971. This reorganization had three facets. First, the directorate reduced its 14 major offices and divisions to 12. This step involved two combinations: first, the Communications - Electronics Division and the Target Acquisition Systems Division merged into the Battlefield Command and Control Division; and, second, the Chemical-Biological-Nuclear Division and the Weapons Division joined to form the Weapons/Munitions Division. The second reorganizational facet entailed the redesignation of seven of its divisions with more suitable names. Thus, as examples, the Air Mobility Division became known as the Air Systems Division and the Foreign Developments Division became known as the Foreign Science and

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Technology Division. As a final measure, the third reorganizational facet concerned the transfers of certain avionics functions to the Air Systems Division; and, all general equipment functions, including camouflage, POL, and water supply, to the Surface Systems Division.

(U) To man its organization, the directorate had 343 assigned personnel spaces as of 30 June 1971, including 294 civilian and 49 military spaces. This represented a loss of 29 spaces from the 30 June 1970 total. Specific losses consisted of one space to the Aviation Office and 28 to Requirements and Procurement. With its remaining assets, the directorate arranged to shift 13 personnel into the T&E Division, raising that division's strength from 9 to 22.

(U) These personnel executed a Fiscal Year 1971 RDT&E Program consisting of 445 DA projects with 1,025 tasks. The cost of this program was \$904.1 million, including \$62.4 million in PEMA funds for 42 projects. The directorate also processed \$131.8 million in non-AMC RDT&E customer orders. This sum reflected 1,578 separate actions spread throughout the command, and included orders from ARPA, DASA, NASA, USAF, US Navy, USMC and AEC.

(U) AMC believed that these RD&E expenditures were inadequate. It reflected this belief in its March 1971 submission to OCRD of the USAMC Five Year RDT&E Program for Fiscal Years 1972-77. Based upon approval by OCRD as of 1 June 1971, this program called for the following funds:

<u>FY 1972</u>	<u>FY 1973</u>	<u>FY 1974</u>	<u>FY 1975</u>	<u>FY 1976</u>
\$1,092,871	\$1,208,450	\$1,265,398	\$1,217,499	\$1,187,065

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HQ, USAMC Org. Charts, 1 Aug 70 and Feb 71.

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(U) RDT&E management and support funds continued to be austere in Fiscal Year 1971. MCA allocations totaled only \$378,000 for that year, including no outlays at all for May 1971. Special Purpose Equipment allocations also suffered, with only \$4,221,303 furnished to meet \$16,916,000 in field installations requirements. Nearly one-half of the equipment allocations went to two facilities. One, a new MCA facility at MICOM, called the Advanced Concepts Laboratory, cost \$921,000. The other, the Fort Detrick Laboratories, used \$1,090,000 to support their phase-out.

Southeast Asia Support

(U) One of the most important ways in which the directorate utilized its funds and personnel continued to be SEA support. This support generally consisted of urgently needed items whose rapid fielding prohibited lengthy research. Of special significance among these items were those concerning aircraft and target acquisition.

(C) In the aircraft area, aircraft weaponization actions commanded much attention. Several of these actions consisted of responses to the ENSURE program. The items concerned varied greatly. They included: a Rocket Control Display System, XM119, designed to identify and permit the discrete selection of 2.75 inch FFAR's with varying combinations of warheads/fuzes; an Armament Subsystem Helicopter, 20-mm Gun, XM35, designed to provide the AH-1G Cobra with a standoff capability against personnel and soft materiel; and the SEA Multisensor Armament System Hueycobra (SMASH), designed to give the AH-1G both multisensors and aerial weapons in a single hunter/killer aircraft.

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(C) Prominent among target acquisition items were two night vision devices for SEA. One was an Image Intensifier System, Night Vision (INFANT) AN/ASQ-132.) INFANT consisted of two parts: one, a low-light level television, direct view image intensifier system; and two, a covert searchlight. AMC integrated INFANT with the M-21 weapon system in the UH-1M Helicopter. As Fiscal Year 1971 closed, eight INFANT's were in SEA for operational use. The other system was a Night Vision System, Passive Infrared (FLIR) AN/AAQ-5. FLIR was a passive IR system for detecting thermal radiation signals, presenting real-time imagery on a cathode ray tube display, and providing surveillance and fire control for the M-21 armament subsystem. Three FLIR's underwent deployment for ACTIV evaluation in Fiscal Year 1971. ACTIV responses were favorable, excepting a few recommendations for the correction of certain design deficiencies.

(C) The directorate acted upon several other SEA support actions. These actions generally concerned items of many types and kinds. In individual weapons, for example, the directorate helped develop a 40-mm HET XM677 Cartridge to improve the combat effectiveness of 40-mm airborne weapons systems in RVN. Other items included a 40-mm Grenade Launcher for the M113A1 APC; a Magnetic Automatic Navigation System for Army vehicles in RVN; and a Miniaturized Key-Setting Device (KYK-38/TSEC) for the WESTOR family.

(U) Although the dispatch of items to SEA was the paramount concern of the directorate, it did conduct an extensive amount of research. Much of this research was compilatory in nature, ranging from the investigation of tritonal and minol for bomb fillings to the development of

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improved atmospheric density tables for artillery use. More complex studies were also underway, one of which was an Army Aircraft Survivability in Vietnam Combat Operations (AASVCO) Study. AAVSCO, begun in the 3rd Quarter Fiscal Year 1970, involved a comprehensive analysis of combat damage and a survey of opinions from involved theater personnel.

Cooperative Efforts

(U) The directorate cooperated extensively in all of its developmental efforts with other defense agencies, private sources, and allied nations. A prime example of such coordination was the directorate's interchanges with other elements in missile technology. These elements included USAF, USN, NASA, FAA, industry, and Canada.

(U) There were several on-going efforts in this cooperative missile technology interchange. In terminal homing, for example, AMC joined with the USAF and USN in studying the Sidewinder Missile Seeker for laser terminal guidance flight tests. In aerodynamic technology, another example, AMC, with NDL, the Air Force Armament Laboratory, and Canada's DREL, established a cooperative program to determine the aerodynamics of wrap-around fins. In propulsion, a third example, MICOM, USN, and USAF participated in planning four cooperative programs called HTPB Propellant Bonding Agents, Carborane Burning Rate Catalysts, Plume Technology, and the Production of Ultrafine Ammonium Perchlorate by Non-Grinding Methods.

(U) This cooperative effort also effected broader areas of interest. An important example of such an area was computer application. In this area AMC cooperated especially with universities and private industries.

(U) One university source, for instance, was the Systems Research Group of Ohio State University. This group lent its technical assistance in making the DYN-TACS model operational at WECOM. The group also, under a \$47,000 contract, accomplished another DYN-TACS task. Part one of this task consisted of making an upgraded version of DYN-TACS operational with a new scenario. Part two involved making a limited number of operational runs.

(U) Private industry similarly aided AMC in computer applications. This aid was of special importance in design engineering due to advances in control feedback and other cybernetic systems. These advances led AMC to expand the use of computer technology to design and engineering in its laboratories. AMC therefore began to develop a formal Five Year Computer-Aided Design and Engineering (CAD-E) Program Plan for the RD&E budget. The principal objective of this plan was, using all known computer advances, to exploit CAD-E in all AMC design and engineering activities. Achievement of this objective was to reduce the cost and increase the efficiency of a product throughout its life cycle.

(U) Implementation of CAD-E was to involve some 125 tasks covering various AMC elements. In their accomplishment of these tasks, the AMC elements concerned were to prove the reliability of the final design of an item by automated simulation testing of computer models. Examples of tasks for testing included simulation of helicopter flights and of control feedback systems such as fire control, helicopter rotor control, and tank turret stability control. AMC elements were to conduct these tests by extensive use of simulation/automation techniques, by minimizing

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repetitive production or prototypes, and by reducing costs of conventional laboratory testing methods.

(C) In addition to US sources, AMC cooperated extensively in developmental efforts with other nations, especially UK, Canada, and FRG. With UK, for example, the directorate member participated on a panel whose main purpose was to promote US-UK missile fuze modeling with Canada, the directorate prepared to aid in a DA-Canadian Department of Defense Production (CCDP) sharing project to develop a Recording Radiation Monitor and an Automatic Radiation Alarm System. Finally, with FRG under an FRG-DOD-DA agreement, HDL representatives began to plan to investigate the TREE susceptibility of German LEOPARD II Battle Tank electronics. Other foreign cooperation included a US-UK Fuel Cell Cooperative Research Program, a US-UK Cooperative Research Project on Light Weight Steel and Aluminum Armor, and a US Norway Cooperative Research Program on Gas and Aerosol Cloud Diffusion Studies. The directorate also actively participated in Quadripartite Working Groups on Combat Surveillance and Target Acquisition Equipment, Sound Ranging, and Night Operations, as well as in NATO panels on Combat Intelligence and FAAR Infrared.

Significant Accomplishments

Surface Systems

(U) The Surface System Division's chief Fiscal Year 1971 accomplishment was its completion of a study entitled "Combat Effectiveness Comparison of M60A1 Tank Mobility Improvements." Originated in July 1970, this study was an effort for the PM-M60 which required the use

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of the DYN-TACS model to simulate a battalion-sized engagement. It represented WECOM's first application of large-scale simulation and the first major application of the DYN-TACS model. The study concluded that the addition of the tube-over-bar suspension system to the M60A1 tank increased its combat effectiveness. The study also indicated the critical impact of the trade-off between vulnerability and firing-on-the-move accuracy both as functions of vehicle speed.

(U) The success of the DYN-TACS application in the M60 study produced a quick result. This result occurred when USACDCEA selected WECOM to apply DYN-TACS in the Family of Scatterable Mines (FASCAM) Study. A DA-directed study, FASCAM's purpose was to evaluate concepts of delivering mines with artillery and aircraft. WECOM's task for the study was to first modify DYN-TACS to simulate artillery-delivered mines, then to apply the model in evaluating alternative FASCAM concepts within a battalion-sized armored engagement. WECOM was at work on this task as of 30 June 1971.

(U) Besides its studies, the division actively monitored several on-going RD&E developments. These developments ranged from hybrid engines to folding sidewall tires. In two areas, recoil mechanisms and electrical devices, the Division monitored so many developments as to constitute a program.

(U) The recoil mechanisms program was heavily concept-oriented. Some of these concepts included: hydropneumatic recoil, which offered the elimination of counter-recoil springs; soft-recoil, which attempted to apply the firing out-of-battery principle to armored weapons; and a compressible fluid recoil, which used a mathematical computer model

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to function similarly to a standard recoil system. The last of these recoil concepts was due for Fiscal Year 1972 testing. This was to be done in a 105-mm, M68 cannon. The other two concepts had not yet undergone all evaluations as of 30 June 1971.

(U) The RD&E electrical program, unlike the recoil mechanisms programs, was strongly item-oriented. These items varied greatly. They included a demountable warning device, a shock-mounted single head-lamp, a water-activated battery, a temperature-regulated voltage meter, and a solid state ignition system. Only the voltage meter had completed field tests as Fiscal Year 1971 ended.

Air Systems

(C) The Air Systems Division's major Fiscal Year 1971 interest was its Aircraft Weaponization Program. The purpose of this program was to field items for SEA use as soon as possible. In conjunction with this purpose, the division helped obtain Limited Production-Urgent Type Classification actions for the XM15 Cannister Cluster, Chemical Agent; the XM76 Sighting System, Antioscillation, the MK45 Parachute Flare, Aircraft; the XM156 Helicopter Mount, Multiarmament; and the 7.62-mm Machine Gun Armament Subsystem, Helicopter. Items type classified Standard A included the 7.62-mm Machine Gun Armament Subsystem, Helicopter, Ramp Mounted Light Weight M41, the M28A1 Armament Subsystem, Helicopter; and the M129 40-mm Grenade Launcher.

(U) The division also had several study projects underway in Fiscal Year 1971. Those projected involved the Tactical Aircraft Guidance System (TAGS), Aircraft Structures and Composites, and Army Aircraft Diagnostic Systems. The TAGS project consisted of the

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development of the TAGS concept to provide a new and more reliable method of flight control employing electronics, instrumentation, electrical-input actuators, and sole control computers. The Aircraft Structures and Composites Project had as its objective the development of an advanced structures technology which, by using such materials as fiberglass-reinforced plastic and boron film composites, was to increase aircraft efficiency by reducing weight, maintenance, and parts. Finally, in army aircraft diagnostic systems, the division awarded five contracts and began one study. Two of the contracts were to investigate concepts of monitoring contaminants in helicopter lubricating oil systems by detection using nuclear attenuation and capacitors. Two other contractors were to conduct an in-depth evaluation of state-of-the-art diagnostic systems on the UH-1H Helicopter. The fifth contract was to conduct an in-depth concept formulation study prior to initiation of engineering development. The study, in addition to these five contracts, was one of method, which included pressure and fluid flow transducers and the progression of mechanical components failures.

Individual Soldier

(C) The Individual Soldier Division's main Fiscal Year 1971 concerns were Fuel Air Explosives (FAE's) for land mine neutralization. A primary FAE candidate was the US Navy BLU 73/B munition containing 74 pounds of ethylene oxide in a small serrated metal canister with a central explosive burster. MERDC evaluated 26 samples of this FAE in Fiscal Year 1971, testing them against more than 1,400 tactically emplaced explosive land mines and booby traps. Results varied greatly,

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depending upon the device to be exploded. US M-16 antipersonnel mines, for example, detonated with 100 percent reliability within a 16-foot radius of the explosive, while Soviet TMD-B Box Mines detonated to a 30-foot radius with 100 percent reliability. MERDC had come to no conclusion about these results by 30 June 1971.

Test and Evaluation

(U) The bulk of Fiscal Year 1971 Test and Evaluation Division interest centered upon the TECOM Test Methodology Project. During the fiscal year, this project consumed over \$6.2 million, with about \$3.4 million allocated to methodology research investigations and almost \$2.7 million to support of the Test, Evaluation, Analysis and Management Uniformity Plan (TEAM-UP). The former expenditure category consisted of studies which covered a wide variety of testing problems. Two studies in this category included one to determine miss-distances and another to correct laboratory vibration schedules by analyzing the transportation vibration environment's effect on various vehicles. TEAM-UP's second category, was in a preliminary phase in Fiscal Year 1971. During that phase, AMC completed a full installation of equipment for science, engineering, and business applications under TEAM-UP, including augmentation equipment for computers at APG, YPG, and WSMR.

(U) In addition to the expenditures noted above, test and evaluation activities utilized \$5.6 million in Fiscal Year 1971 for instrumentation. This sum covered the development and procurement of instrumentation at TECOM and for maintenance of instrumentation at the Army Missile Test Directorate of WSMR. Significant acquisitions for this program included an automatic fluorescent particle collection and evaluation facility at

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Deseret Test Center, modification of cinetheodolites at Yuma Proving Ground, and development of a laser tracking system.

Weapons/Munitions Systems

(U) The Weapons/Munitions Systems Division's prime Fiscal Year 1971 interest was to help expedite as many crew-served and individual weapons systems actions as possible. In the former category, TC Std. A actions included the 165-mm; TP, M623 Cartridge for the M728 Combat Engineer Vehicle, and the Antipersonnel T-M581 106-mm Cartridge for the 106-mm, M40A1 Recoilless Rifle. Individual weapons systems type classified as Std. A included the M69 Hand Practice Grenade and the HEDP M433 40-mm Cartridge.

(U) The division's other main interest area concerned its nuclear-related actions. As in weapons systems, this area was heavily item-oriented. Items ranged from a field radiac calibration device to a computer model for the prediction of fall-out by the Army in the field.

(U) Unlike the weapons systems area, however, the division's nuclear interests also concerned several developments with wide applications and long-range interests. These developments covered a wide spectrum of activities. Among the most important of such activities were those in electromagnetic pulse (EMP) research, in nuclear projectiles, in atomic demolition munitions, and in electronic fuzes.

(C) EMP research involved several studies. Principal among these studies were theoretical and digital computation research studies which both advanced understanding of EMP and provided nuclear EMP environmental criteria for use in Army EMP vulnerability and hardening studies. Of particular importance was the data produced by a theoretical

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high-altitude nuclear blast. This data included EMP environmental codes for the calculation of magnitudes of electromagnetic fields; a methodology for the determination of antenna response to EMP input; and methodology to determine induced electromagnetic effects on a missile flying through ionized regions. All of this data, with other results from the studies, permitted updating of the DASA EMP handbook.

(C) The AMC Blast Program for Fiscal Year 1971 included the conduct of the DIAL PACK 500-ton HE Blast Simulation Test. Sponsored by DASA and the Tripartite Cooperative Program, the test utilized AMC funds for two LANCE's various Army fixed-wing and helicopter aircraft, and those Army electronic shelters used in TACFIRE and other Army systems. The test determined experimentally the blast susceptibility of the AMC items. By the end of Fiscal Year 1971 the program's next phase, MIXED COMPANY, had completed the planning in which BRL, in conjunction with DASA and ABMDA, had initiated structural experiments addressing both blast and X-ray lethality problems.

(U) The New Electronic Fuze Systems Project involved conceptual tasks which ranged from small caliber to nuclear missile fuzing.* The intent of the project was to use these tasks to better attack targets which varied from ground to high-speed airborne. The project buttressed this conceptual approach through several related efforts, such as fuze-warhead optimization, intercept geometry studies, and terrain-return analyses. Specific developments under this project included two optical fuzes to provide true slant range fuzing, a fuze to utilize FM noise, a cannon-launched beehive fuze to function at maximum weapon range, and two impact override air target fuzes to insure functioning

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*Electronic fuzes, the fourth major divisional category effort, included supporting research in four projects: New Electronic Fuze Systems; Electronic Counter-counter measures; Components; Materials and Techniques; and Instrumentation, Measurement and Simulation.

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at closest approach, whether or not the missile was on an impact trajectory with the target.

(U) The Electronics Counter-counter Measures Project directed its attention to insuring optimum effectiveness of electronic fuzes in battlefield environments against both active and passive emanations. All CCM concepts in this project were undertaken to combat known enemy counter-measures technology capabilities. Particular Fiscal Year 1971 efforts in CCM included discrimination against chaff and digital signal processing.

(U) The Components, Materials and Techniques Project focused upon the initial design and evaluation of components and subassemblies achieve improved performance in fuzing systems. This goal involved several actions, one of the most important of which was investigation of the fuze-on-a-chip concept. This concept incorporated all the electronic functions for a fuze on a single monolithic silicon chip, thus permitting designs of very small and cheap electronic fuzes for grenade, ICM's, and mortars. Other actions in this category included developments of low cost detonators, of a solid state high resolution fuze system using the short pulse RF generation properties of avalanche diodes, and of an electronic safing and arming device.

(U) The Instrumentation, Measurement and Simulation Project continued to concentrate upon improving methods of fuze simulation and obtaining fuze and component test data. There were two major actions in this project in Fiscal Year 1971. One involved a telemetry band change for artillery telemeters from VHF L and S bands. The other concerned artillery simulation work directed at design and fabrication of a

3-inch diameter simulator for testing complete mortar and artillery fuzes.

(U) In addition to these projects, AMC continued to cooperate in the Transient Radiation Effects on Electronics (TREE) and Project MEXPO actions.²

Battlefield Command and Control

(U) The Battlefield Command and Control Division's major Fiscal Year 1971 aim was to insure that the future Army had the most modern, cost effective, tactical net radio equipment. This goal involved two major actions. The first was the initiation of studies to determine the most advantageous developmental approach for a modularized, lightweight radio net system operating in the 200 to 400 MHZ band. The other step was the placement of dual competitive contracts for the design and associated cost of ownership of a modularized tactical VHF FM net radio system for manpack, vehicular, and aircraft applications.

(U) HELMS was an acronym for Helicopter Multifunction (RADAR) System. It featured the incorporation of an antenna in the rotor blade. This technique was explored jointly by the Army and Navy. This provided a high resolution radar without blind spots characteristic of helicopter radar installations and without degrading the aerodynamics of the aircraft. HELMS was initiated in the last quarter of Fiscal Year 1968. Three advanced development models were procured in May 1970 for military potential testing. Two of these models were installed in a UH-1 aircraft. The Army accepted all three models in June 1971.

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Details of the TREE project are omitted because of their SRD classification.

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(C) During this fiscal year the AMC investigated a number of target acquisition systems. One of the few requests approved by the Department of the Army, for application in CONUS, was to provide selected Explosive Ordnance Disposal teams with a portable fluoroscope for use with a portable X-ray for rapid search of baggage and packages. By the end of the year, the equipment had been selected, and some had been released to the field by MUCOM where it underwent evaluation.

(C) To protect key public figures, the Command became interested in a handgun detection system, which, when sensing a sufficient amount of metal, triggered a low dosage X-ray, providing an image of the subject. MERDC was developing the system, with emergency funding by DDRE.

(C) Among the other most important target acquisition systems under consideration were the following: a laser target acquisition system for marking landing zones and friendly positions day and night; a counter mortar radar; a combat vehicle mounted xenon searchlight; a portable radar with remote control for operator protection for Marine Corps use; a night sight for the TOW Weapon System; a pulse-gated image intensification system for acquisition and tracking capability; a smaller lighter TOW Night Sight for the DRAGON Weapon System; and ground sensors for battlefield surveillance. The latter program followed the successful application of the technique in Southeast Asia.

Research

(U) During this year the Research Division performed research in a wide variety of categories, including fuels, lubricants, metals, ceramics,

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explosives and pyrotechnics, lasers, soils, and the ionosphere. Research personnel tested sub-zero crankcase oils in Alaska during winter with considerable improvement noted in performance of internal combustion engines over previous tests. In the field of metals research it was determined that the addition of relatively small amounts of copper to titanium alloys formed the ideal texture. This method provided improved alloys for critical applications in aircraft and missiles.

(U) In organic materials research, by utilizing certain dyes that responded in the near infrared region of the spectrum, photographic and night vision sight devices had their maximum sensitivity. By using a new fabric construction, a broad band camouflage protective system had been developed which encompassed for the first time the full visual and near infrared range combined. This made it possible to defeat all detecting systems operation from the ultraviolet through the near infrared portion of the spectrum. This camouflage was being applied in developing a new generation of combat clothing.

(U) High strength beryllium oxide alloys had been produced on a laboratory scale. Research had been initiated on a carbon fiber-magnesium composite system. Substantial improvements had been made in radar absorbing materials. In the field of chemistry, a fast neutron activation analysis facility was set up at Picatinny Arsenal for non-destructive analysis of explosives and related materials. Other chemical research pertained to extending the polymer storage life of battery molding and computer techniques in analyzing high molecular weight constituents in natural products.

(U) Explosives and pyrotechnics research encompassed a method to determine nitrogen and fluorine in fluoronitro compounds. Picatinny Arsenal won first prize at the Army Science Conference for research on the structure and lattice dynamics of metal azides and their relationships to stability. Among other accomplishments, Picatinny achieved a direct electronic initiation of a primary explosive by a stimulus from a combination of an electrical field and optical illumination.

(U) Specific studies initiated on air pollution abated concerned a reduction in the magnitude of pollution sources by the use of control devices and adjustment of fuel composition. A disposition form was approved for the design, development, fabrication and testing of a model for portable radar wind measurement equipment. In-house development continued on the Meteor Trail Radar, an advanced upper atmosphere meteorological sounding facility. The initial installation of this radar was completed at White Sands Missile Range. Additional facilities for the radar were planned for Ft. Greeley, Alaska, and the Panama Canal Zone. Under AMC leadership, four portable automatic weather observing stations were completed. One model was to be used for laboratory demonstrations, and three were to be used for air-drop tests.

(U) During this fiscal year the command completed the following seven AMC Engineer Design Handbooks: Design Guidance for Producibility; Value Engineering; Design Criteria for Environmental Control; Hydraulic Fluids; Infrared Military Systems, Part One; Hardening Weapons Systems Against RF Energy; and wheeled amphibians. The AMC revised the following existing Handbooks to reflect latest technology: Tables of the

Cumulative Binomial Probabilities; System Analysis and Cost Effectiveness; and Fire Control Compiling Systems.

(U) In another area, the AMC started a new study on the frequency conversion of high energy lasers. The goal of this laser study was a greater delivery of energy to the target. In still another area, the Command added a task on the fundamentals of combustion to the AMC Gun Propellant Research Project.

(U) Research continued on cold regions associated environmental problems, such as the influence of defective structure on ice adherence; the effect of X-ray irradiation on the internal structure of ice adherence; and dynamic behavior of frozen soils. Another area of interest was the ionosphere, which was a joint ARPA-DASA project. This project encompassed the effect of high-altitude artificial barium clouds on signals propagated through it, and the determination of the cloud's ionization. Knowledge of atmospheric reactions in the ionosphere was essential for the development of ballistic missile defense and strategic communications systems.

Missile Systems

(U) In the guided missile area, the Command centered its attention on such factors as technology generally, guidance, aerodynamics, structures, ground support equipment nuclear warheads, engine technology, and propellants. Both the TOW missile and its Land Combat Support System were type classified Standard A during this year. In the sensor program the chief efforts were devoted to completing the design of significant segments of the antenna, receiver transmitter, and the Experimental Array Radar (EAR) for air defense missile systems. Also, the weapon systems

concepts of the Army Missile Plan received considerable attention.

(U)Engineering development continued on the LANCE Missile System, with the engineering test phase being initiated in the last quarter of this year and the initial procurement being placed in January 1971. Pershing Missile check tests were completed in the last half of the fiscal year and operational test firing were conducted at Green River, Utah.

(U)A flight demonstration test program was designed for evaluating laser seeker homing concepts. The plan provided for the use of Air Force Hornet Missiles to provide the desired velocity. A modified Navy Sidewinder seeker provided the laser detector instead of the infrared detector for this test program.

(U) Missile ground support techniques and equipment under development consisted of such items as a computer simulation program to simulate launcher performance, and a 3.1-inch rocket to be used as a test vehicle to determine the accuracy of predicted results.

(U) The BOMAT (Bomblet Anti-Tank) Non-Nuclear Warhead was expected to move into the advanced development stage in Fiscal Year 1972. The BOMAT's objective was to develop an effective anti-armor, lethal mechanism, and a method of delivering these units against tanks and armored personnel carriers.

(U) New technology was introduced into missile systems during this period. Terminal homing activities were expected to result in the establishment of four new advance projects in Fiscal Year 1972. The Defense Special Projects Group reviewed MICOM's program on LASER illuminators and was considering the possibility of adding their requirements and fiscal resources to the MICOM effort with which they

were enthused.

(U) Technical requirements for test plans for dropping infrared sub-missiles had been completed. Requirements for the flight demonstration program were almost completed at the end of this year. Arrangements had been made to acquire six Lance dispersing type warheads and six Honest John propulsion sections, without cost for use in this program.

Significant Activities

Foreign Science and Technology

(U) The major activities in the foreign science and technology area during this year concerned the analysis of capabilities and weaknesses of potential enemy equipment, scientific and technical intelligence, central information and reference control, the relocation of the Army Foreign Science and Technology Center, and the Foreign Intelligence Officers' Seminar. In the first named category above, the AMC prepared Current Analysis of the Threat Studies, the Lance Missile System, the M110E2 Improved 8-Inch Howitzer, and the TOW Antitank Missile System.

(U) During Fiscal Year 1971, AMC Foreign Science and Technology Center personnel gave briefings to the Commanding Generals of AMC, CDC, and CONARC on the following: The Threat to US Antiarmor Missiles; current SA-2 and SA-3 threats to the Suez Canal area; US/USSR ABM systems; Soviet CBR reconnaissance capabilities; Soviet tactical nuclear capabilities; Soviet conventional munitions technology; Soviet Air Defense Engagement Model SEA; Soviet heavy lift helicopter; and Soviet Gap Crossing Equipment.

(U) In Fiscal Year 1971, the AMC expanded its participation in the Central Information and Control-on-Line (CIRCOL) System. DA granted approval for the installation of CIRCOL terminals at AVSCOM, ECOM, MECOM, MUCOM, WECOM, ARDC, and White Sands Missile Range. Requests had been submitted to STRATCOM for the necessary equipment.

(U) On 25 August 1971, the US Army Foreign Science and Technology Center was officially relocated to Charlottesville, Virginia. In December of that year, the Foreign Intelligence Officer (FIO) Seminar at Charlottesville brought together all FIO representatives within the AMC. Major discussions at the seminar centered on improving intelligence support to research and development and acquainting the FIO's with the many facets of the Army intelligence system.

Weapons/Munitions Systems

(U) On 20 October 1970, the Director for Laboratories designated Harry Diamond Laboratories (HDL) as the AMC Lead Laboratory for Nuclear Weapons Effects Research. Under this concept, this laboratory became responsible for formulating this program for the AMC. On 30 June 1971, the Nuclear Electromagnetic Pulse Laboratory of the Mobility Equipment Research and Development Center was abolished and became the Electromagnetic Pulse Laboratory of HDL.

Chief Mathematician

(U) In his study on the Main Battle Tank-70 (MBT-70) ammunition requirements, the AMC Chief Mathematician supported a laboratory cycling approach to establish safe lift of gun tubes and recommended scavenger efficiency tests for scavenger safety releases. His study revealed that a savings of at least 3000 rounds could be made if his recommendations

were followed. The Chief Mathematician's Office provided direct technical support to the Lance Guided Missile project and monitored Dragon missile engineering analysis test and reviewed firings service test plans for the Dragon.

Engineering

(U) During Fiscal Year 1971, the Engineering Division initiated and carried out numerous actions that resulted in significant improvements in operations. For example, the Division applied system engineering to the surface-to-air missile development program and published a regulation on system engineering.³ Among the Division's other accomplishments were the following: the initiation of a course in system engineering at AMETA; revised a technical manual entitled "A Guide to System Engineering;" contributed greatly to product improvement and configuration management; handled 41 percent of over 40,000 standardization documents assigned by the Army Departmental Standardization Office; and sponsored a review of pollution abatement capability and needs.

Aircraft Systems

(U) The Aircraft Weaponization Program continued to call for investigations and studies in order to compile data to use as a basis for key decisions on improving aerial weaponry. For example, this program involved the studies for evaluation of concepts from industry to meet selective armament system requirements, the evaluation of the Redeye Missile as a helicopter weapon; and the effectiveness of the TOW,

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AMCR 70-52, subj: System Engineering, 7 Oct 70.

DRAGON and HORNET on the LOH helicopter.

Surface Systems

(U) Among the many activities of the Surface Systems Division during Fiscal Year 1971 were the following: made informational briefings to the Infantry Agency at Fort Benning, the Armor Agency at Fort Knox, and the Combat Arms Group at Fort Leavenworth; briefed the US Army Staff on a Belgian fire control system; reviewed current developments and anticipated state-of-the-art relating to firepower systems; and completed a cost-effectiveness study of prefabricated landing mats; participated in a working group to establish an international study group to formulate bridge concepts for the 1980's.

Battlefield Command and Control

(U) At the direction of the Army Chief of Staff, the AMC, in coordination with CDC, developed the Army Area Communications System. The Command contributed significantly to the overall Army effort in developing and editing the Tactical Data Systems Master Plan.

(U) In February 1971, DA expressed concern regarding management of night vision devices for airborne, missile, combat vehicle and ground applications. Consequently, the AMC performed a staff study on night vision management. At the end of this fiscal year, the summary sheet action was being held in abeyance by the AMC Deputy Commanding General for Materiel Acquisition pending review by the Commanding General of the Electronics Command.

Research Division

(U) Since fuel-air explosives have a higher content than conventional high explosives, the Joint Technical Coordinating Group for Munitions

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Effects undertook a program to determine the lethal mechanisms and effectiveness of the former type. The findings of this research were to be incorporated into recommendations to DDR&E for use with future weapon systems employing these explosives. Among the Division's other programs were the following projects: eleven meteorological research and development teams in the US, Panama Canal Zone and Alaska provided year-round support for DDTE programs and collected data from approximately 600 high-altitude (250,000 feet) meteorological rockets and associated upper air observations. A White Sands meteorological team supported approximately 4,900 range firings as required under the National Range Testing Program; meteorological teams provided support for demilitarization and detoxification programs for the destruction of obsolete toxic munitions, including support for transfer of toxic munitions from Blue Grass and Anniston Army Depots to the military ocean terminal at Sunny Point, South Carolina for transport to the open sea and disposal by sinking the munitions in the Atlantic Ocean.

Missile and Rocket Systems

(C) The work on these systems involved such projects as the following: the design and fabrication of a "work horse" launching tube for the 3.1 inch rocket; the technical problems of the helicopter down-wash on seeker systems; pulse lasers; effectiveness trade-off and risk analysis of tube-launched shoulder-fired weapons; engineering analysis of a low altitude air defense system; a digital pulse compression study; design of a digital track-while-scan computer capable of tracking 16 different targets simultaneously; nuclear weapons effects; thrust effects on missile aerodynamics; a risk analysis study of Dragon rocket

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motors; and flight testing of a laser-guided Littlejohn to demonstrate the feasibility of indirect fire, terminally guided missiles.

(U) Other missile system projects involved work on experimental array radar which supported the development of sensory technology applicable to a wide variety of air defense missile systems. Simulation models of fluidic directional control had been developed and design parameters had been determined.

(U) During this year, AMC personnel visited a number of foremost authorities in the area of failure analysis of fiber composites. These included Dr. N. V. Pagano and Dr. J. M. Whitney of Wright-Patterson Air Force Base and Dr. V. D. Azzi of the University of New Hampshire. All concurred in the Army Missile Command's approach to failure analysis solutions.

Test and Evaluation

Surface Systems

(U) The Surface Systems Division devoted its attention primarily to such tasks as testing automatic ammunition loaders to obtain data for continuing concept formulations, and coordinating test plans for floating bridges. Among the other programs were those concerning stabilization dynamics and reliability problems on three contractor M60A1E2 tanks, and generating diagnostic data by firing tanks at stationary and moving targets. These tests provided critical data needed for developing a fire-on-the-move analysis technique.

Air Systems

(U) During Fiscal Year 1971, the AH-56A Cheyenne Armed Helicopter

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underwent development and preliminary Army testing at Yuma Proving Ground, Arizona. Many diverse aspects of the Cheyenne had to be addressed during the tests in which many cognizant test agencies participated. A somewhat unique approach was utilized in which representatives from each cognizant agency were on the site at Yuma in order to conduct as much simultaneous testing as possible. This approach was expected to result in a significant overall time saving.

Test and Evaluation

(U) In January 1971, Deputy Secretary of Defense Packard requested that the armed services conduct a joint review of the RDT&E base to determine the essential research and development needs of the Department of Defense, with the goal of eliminating the non-essential ones and consolidating the others. Secretary Packard assigned the overall responsibility for the review, which was to be completed by 30 June 1971, to Dr. John S. Foster, Defense Director of Research and Engineering. A steering committee of service representatives acted as an executive planning and evaluation body. The DOD study was conducted in the following five phases: determination of test requirements for the Fiscal Year 1971 - Fiscal Year 1980 period and beyond; the review of the existing test and evaluation base; the determination of the optimum test and evaluation facilities; the plan to achieve the optimum from the existing base; and the implementation of the last phase of the plan.

(U) Study groups of representatives from the services assisted in the review. As data was received in the AMC Research and Development Directorate, it was checked for format and completeness and was then

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sent to the interested commodity division in HQ AMC for review. After completion of this review, six copies of the report were forwarded to the Phase III Study Group in late April 1971.

Chief Mathematician

(U) During Fiscal Year 1971, the Office of the Chief Mathematician participated in a number of major projects. Among the most important projects were the following: the test plan for the MBT-70 Combustible Cartridge Ammunition; contractor, engineering, and service tests for the M60A1E2 tank; a research paper on analysis of complex Multi-Factor Experiments by Dr. Kurkjian, which was presented to the Army and professional societies; and review of the Hawk Missile demonstration test plan.

Battlefield Command and Control

(U) All projects monitored by the Battlefield Command and Control Division were concerned with test and evaluation of hardware. The following items are examples of the variety of tests accomplished. The Handheld Thermal Viewer, AN/PAS-7 was a small, lightweight night vision device using the far infrared principle for detection. Project MASSTER tests showed quite favorable results and resulted in a recommendation that this viewer be fielded.

(C) The AMC supported the USAREUR Line Sensors MCA Project. This project grew out of the recognized need to improve security at sensitive sights in USAREUR. Evaluations indicated that the use of sensors would improve security. The USAREUR MCA project was directed toward a limited operational deployment of the acceptable line sensors at five cities in USAREUR. The Department of the Army directed the

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AMC to support this project.

(C) Project MASSTER conducted a physical security systems test at Savanna Army Depot and Ft. Hood during Fiscal Year 1971. AMC made a significant contribution during the planning phase for the test and provided support during the test. The test consisted of various STANO devices as a means of improving the security of sensitive installations in Europe and critical ammunition storage sites in Southeast Asia.

Missile Systems

(U) The problems in the missile system area primarily concerned missile technology related to ground support equipment, aerodynamic technology, and missile structures. In the ground support area, the chief problem was to resolve discrepancies between predicted values of tube pressures and recoil impulses. In the area of aerodynamic technology, the AMC attained the support of both the Air Engineering Development Center and Eglin Air Force Base in its wind tunnel tests and fabrication of effective wind tunnel models.

Scientific and Technical Intelligence

Foreign Science and Technology

(U) Based on the realization that there was a lack of good foreign science and technology programming data upon which meaningful workloads could be determined, the AMC implemented a program to improve foreign scientific and technological developments in the research and development process. The identity of intelligence support, or the lack of it, was identified against specific research and development projects in order to establish an intelligence support file for each research

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and development project. Field operations reports were utilized for this purpose.

(U) In June 1971, AMC began a program to identify specifically designated intelligence positions and required that all persons in such positions be listed in the Intelligence Civilian Career Program. These procedures were expected to aid in identifying and utilizing intelligence-related experience throughout the AMC.

(U) During Fiscal Year 1971, the DA Assistant Chief for Intelligence (ACSI) initiated a requirement that all Army, outside of AMC Departmental Direct Support Tasks, except quick reaction requirements, be submitted to ACSI for validation and assignment of task numbers. The Command followed up on this requirement. The new procedure facilitated more accurate work measurements of time spent on departmental tasks and permitted the maintaining of a production schedule to insure that consumers requirements were satisfied in the timeframe requested.

Surface Systems

(U) Among the most significant tasks in the surface systems category, was that concerning the performance of the Belgian Army Gun Tank, performance estimates of US systems. The analysis showed that the Belgian and US developmental equipment were similar in concept and performance.

Missile Systems

(U) In the area of aerodynamic technology as applied to missiles, consultation between the various agencies provided technical and scientific data that could be used in evaluating similar foreign technology. AMC representatives provided technical information

to various intelligence agencies on the non-nuclear warheads for guided missiles. Consultation between the Army, Air Force and research groups of various educational facilities continued in order to provide a continuity in the dissemination of technical and scientific data that could be utilized by other agencies to evaluate similiar foreign technology.

Management Systems and Procedures

(U) Under the heading of Management Systems and Procedures came the Chief Mathematician and the following divisions: Engineering, Plans & Programs, Test and Evaluation, Battlefield Command & Control, Research, and Missile Systems. The Chief Mathematician was responsible for technical review of risk analysis submitted to HQ, AMC from all subordinate commands, and providing technical support in planning ALMC courses in risk analysis. He also supported WECOM, Picatinny Arsenal and several projects in risk analysis and promoted risk analysis techniques throughout the AMC.

(U) The Test and Evaluation Division reviewed consolidation test programs, managed the Army portion of the DOD National Range Mission as defined by directives, and directed that subordinate commands coordinate their testing workload with TECOM. Problem areas were resolved by the AMC.

(U) The impact of PROMAP-70 continued to have the most significant influence on management improvement in production engineering. Within the framework of PROMAP-70, the requirement for reporting on the status of certain projects was initiated. The first report, in October 1970,

gave the status of 113 projects having a total value of \$175,000,000. The second report, in April 1971, contained data on 155 open Fiscal Year 1971 and prior projects having a total value of \$266,000,000.

(U) Under PROMAP-70, the field submitted a one-time status report on OMA production engineering in early Fiscal Year 1971. This report provided a data base for evaluating possible solutions to existing deficiencies in documentation relative to program requirements and accomplishments. Among the other most important activities in this area during this year were the Fiscal Year 1972 AMC Product Improvement Program. Review, and the briefings on new product improvement philosophy given by General Gates at Commanders Conference on 16 October 1970.

Plans and Programs

(U) During this year, a joint AMC/CDC board recommended the streamlining of materiel requirements documentation. A joint AMC/CDC Committee began conversion of the materiel need format. This reduced the life cycle steps from 239 to 153, and processing time was expected to be reduced from 2½ years to 30 weeks.

(U) Effective 29 June 1970, the Command discontinued the AMC Technical Committee as a separate office of the Research, Development and Engineering Directorate, and transferred its functions to the Technical Plans and Analysis Branch. Two of the Committee's ten employees were transferred to the Branch. The remaining eight were assigned to other jobs.

Battlefield Command and Control

(U) Most of the communications security (COMSEC) items were developed by the National Security Agency, which was not subject to Army

regulation. Therefore, there were difficulties in meeting Army management requirements leading to standardization. No Army developer had previously been charged with this responsibility for NSA items. A new regulation (AR 530-2) designated the AMC to perform these functions for specific items on an assigned basis. This new responsibility required additional manpower. The SIGSEC Management Study Committee directed that a plan be prepared for transfer of the COMSEC logistics mission, currently assigned to STRATCOM, to the AMC. During Fiscal Year 1971, two former branches were consolidated into one known as the STANO Branch, which was concerned with all technical hardware programs in the surveillance, target acquisition and night vision areas. During this year, the Project Manager, SEA NITEOPS was phased out, and all functions were absorbed by the Project Manager for Night Vision.

Research Division

(U) During Fiscal Year 1971, the Earth Sciences Laboratory of Natick Laboratories was transferred to the Army Corps of Engineers and, in turn was assigned to the Engineer Topographic Laboratory of the Topographic Command (TOPOCOM). AMC research in the terrestrial sciences, that had been done at Natick, was to be continued at TOPOCOM. Staff management of this research was to be directed from HQ, AMC.

(U) The Research Division placed increased emphasis on the laser projects under its control, including the preparation and approval of the QMDO plan for controllable beam weapons. Concurrently, the US Air Force reprogramed its laser weaponry funding to a level twice the existing Fiscal Year 1972 and Fiscal Year 1973 levels.

(U) AMC Headquarters provided, through intensive action, a number of significant actions in the DOD Independent R&D Program. Among the most important actions were the following: on-site reviews and program evaluations of contractor programs; preparation of more than 100 information summaries on R&D contracts; preparation of summaries on over 100 R&D contractors to facilitate communications between AMC scientific personnel and contractors to effect greater utilization of the wealth of technical information involved; development of new evaluation sheets to assist in technical assessment of programs; on-site reviews of 76 contractors to permit advance planning; and the drafting of a new DOD Instruction on technical evaluation responsibilities of the three services.

(U) Among the most important remaining efforts of the Research Division were the following: civil disturbance control materiel research; fuel-air explosives coordination; participation in the Joint Implementation Committee for the Materiel Need Concept; close collaboration with the AMC Deputy Director of RD&E for Planning; processed and submitted approximately 20 Qualitative Materiel Approaches to the Combat Developments Command; provided information to the GAO teams reviews in the areas of weapon acquisition, and coordination of psychological (behavioral) and social science research in DOD; and the continued supervision of research grants with Case Western University and Northwestern University.

Missile Systems

(U) A significant event of this year was the selection of the Army Missile Command laboratory complex to conduct a trial experiment of

the Single Program Element Function Concept, with the eight laboratories considered as a single laboratory or R&D center for the purpose of the experimental program. This would grant the center's director maximum flexibility for use of all available resources.

(U) The missile technology-experimental systems work was being accomplished under a single element funding program. This permitted more frequent personal discussions between the Laboratory Director and the AMC technical point of contact.

(U) Among the other missile system areas that received attention during this year were the following: non-nuclear warhead advanced development; missile ground support equipment; nuclear weapon effects; inertial guidance; aerodynamic technology; and missile structures. Personal discussions and briefings were held frequently on the various technical and operational problems related to missile systems.

CHAPTER V
REQUIREMENTS AND PROCUREMENT

(U) The Directorate of Requirements and Procurement (AMCRP) was organized in November 1969 by combining the Directorate of Materiel Requirements and the Directorate of Procurement and Production. It contained four coordinating divisions and 16 commodity divisions, and retained this structure through Fiscal Year 1970. Pursuant to required reductions in manpower, on 1 July 1970 the coordinating divisions were reduced to two divisions (Procurement Policy Division, and Plans and Programs Divisions), and the commodity divisions were reduced to 15 divisions.

(U) AMCRP was reorganized two more times before the end of Fiscal Year 1971. In March 1971, five of the 15 commodity divisions were designated lead divisions, and their respective chiefs assumed overall functional responsibility. This arrangement continued until 30 June 1971 when a new organizational structure was provisionally approved, consisting of two coordinating divisions and five commodity divisions. The new provisional organization, also, included the Operations Analysis Office, Small Business Office, Contractor Labor Relations Office, and the Industrial Preparedness Division.

1

(U) In the 3 May 1971 reorganization¹ the Air Systems Division was formed by the consolidation of the Rotary Wing Division, Fixed Wing Division, Avionics Division, and the Aircraft Weaponization

¹
Ltr from Director, Requirements and Procurement, subj: Realignment of HQ, US Army Materiel Command, dated 29 Apr 71.

portion of the Individual and Crew Served Weapons Division. The new
2
division, which functioned on an aircraft system basis, consisted of
the Aircraft Systems Branch, and the Systems Support Branch.

(U) In creating the Weapons Munitions Systems Division, a closer
liaison was envisioned between weapons and ammunition programs and
systems, within the life cycle materiel management concept. Absorbed
into the new organization were three divisions that were redesignated
as Conventional Ammunition Branch, Special Ammunition Branch, and
Individual and Crew Served Weapons Branch. The two ammunition branches
interfaced with the US Army Munitions Command.

Industrial Preparedness

(U) During Fiscal Year 1971 the DOD Joint Logistics Review Board
(JLRB); the Presidential Blue Ribbon Defense Panel; and the DOD/
Industry Advisory Council (IAC) each conducted extensive reviews which
thoroughly analyzed all phases of Industrial Preparedness Operations
and Production Base Support. Functions and programs impacting on the
Industrial Production Base were all closely scrutinized.

(U) The Presidential Panel and JLRB leveled numerous criticisms
at the program. These criticisms provided the impetus for an investi-
gation, by the DOD/Industry Advisory Council, into methods for improving
the management and conduct of the program. Many improvements recom-
mended by IAC were being considered for implementation.

2

Mission Statement, Directorate Requirements and Procurement.

(U) Industrial Preparedness Operations manpower allocations continued to decline during Fiscal Year 1971, as shown by the following: 471 spaces for FY 1971; 648 spaces for FY 1970; and 1096 spaces for FY 1969. The FY 1969 manpower allocation was inadequate to meet DOD/DA objectives. When this downward trend continued in Fiscal Year 1970, it necessitated a serious review of DOD/DA program objectives versus AMC manpower capabilities. This review resulted in a new AMC policy guidance directing concentration of effort on items most critical to the Army readiness posture.

(U) The AMC guidance, provided to DA(DCSLOG) on 11 September 1970, indicated that the application of the new policy guidance would permit intensive management of 1900 items. This would include approximately 1400 principal items in the Army Materiel Plan and 500 critical production components. An average of 2400 items were previously involved in the planning process. Department of the Army (DCSLOG) accepted on 28 September 1970 the AMC guidance with minor modifications.

(U) In consonance with the new policy guidance, the AMC Emergency Production Planning List (EPPL) was updated. Extensive review of item coverage was performed at the Headquarters, AMC level prior to submission to higher authority. This document (EPPL) permitted management levels to reorient the utilization of the Industrial Preparedness Personnel, and provided rapid identification of various data, such as responsibility for planned end items and components.

(U) In response to executive level study group recommendations, an extensive, closely monitored effort was undertaken by the AMC complex to develop a common visual data display method and prepare a study

depicting the status of the Industrial Production Base. The study, commonly known as the Study of Alternative Production Base Planning Objectives, or Base Retention Study, provided management with a comprehensive display method document. Along with a variety of other management factors, it depicted requirements, planned producers, planned production capabilities, end item inventory deficits or excesses, and costs associated with the Industrial Production Base. Judged to be the most comprehensive document ever produced on the Industrial Production Base, this study would enable increased effectiveness in management decision making (regarding proper utilization of manpower and funds), and need for more responsive base. Also, the study provided operational levels with a ready reference designed to eliminate the need for a variety of independent study efforts requiring multi-command participation.

Production Base Support Program

(U) Programs continued in the Army's Fiscal Year 1971 apportionment request with the final AMC program follows:

	<u>\$Millions</u>	
<u>Production Base Support Programs</u>	<u>Apportionment 1 June 1971</u>	<u>Final AMC Program</u>
Aircraft	\$2.4	\$4.1
Missiles	7.4	4.0
Weapons and TCV	59.7	58.9
Facilities	170.6	174.7
Layaway	16.4	16.4
PEM's	34.9	38.0
TOTAL	<u>\$291.4</u>	<u>\$296.1</u>

facility which transferred to the Chief of Engineers. The program of 2.1 million was retained by AMC and used to cover other facility requirements. Four acid projects for Radford, Indiana, and Joliet Army ammunition plants amounting to \$21.3 million were deferred to later fiscal years. Similar project for \$4.5 million to modernize an acetic anhydride plant at the Holston Army Ammunition Plant was deferred. Also, there were reductions in 12 projects aggregating \$7.0 million.

(U) Project increases and late starters added to the program. Significant increases amounting to \$20.9 million were made in the modernization of Army Ammunition Plants (AAP). The higher costs were approved pursuant to construction cost estimates for these facilities made by the Chief of Engineers and accepted by DCSLOG, DA and OSD(I&L). Sixteen late start projects totaling \$18.2 million were added to the program during the fiscal year. The most significant of these late start projects included the Power Transmission Loop for \$3.0 million at the Radford AAP; the new concept facilities for small arms cartridge cases for \$5.6 million at Lake City AAP; the fuze facilities for \$2.0 million at Hamilton Watch; and the underground water system for \$3.1 million at Badger AAP.

(U) Considerable reprogramming of Production Engineering Measures (PEMs) caused an increase of \$3.1 million. However, six projects amounting to \$2.8 million were deleted from the PEM program. ECOM alone dropped three projects and reduced seven others for a total of \$3.1 million. That action (ECOM's) was prompted by a policy of retaining only that program which could have been awarded by the end of the fiscal year.

(U) The increase, as shown above in the aircraft budget, was caused by a late start requirement to layaway facilities at Bell Helicopter for the production of AH-1G, UH-1H and OH-58A aircraft at a cost of 1.7 million. Missiles, however, shows a decrease of \$3.4 million. The apportionment program included a project for APE DRAGON Weapon System. DCSLOG later funded the DRAGON requirement of \$3.7 million with prior year PEMA hardware funds. A facilities project for annual support for the Michigan Army Missile Plant was reduced by \$0.3 million from \$1.5 to \$1.2 million. There were late start facilities requirements for the TOW missile system, and for layaway of SHILLELLAGH special tooling, test and final assembly equipment. These were small projects and amounted to \$0.6 million. Changes such as described produced the final AMC missiles program of 4.0 million. Savings of \$0.8 million were achieved in the Weapons and Tracked Combat Vehicles program. These were due to the reduction in the Watervliet Arsenal Production Support Project, and in the layaway of facilities for the M73E1 Machine Gun (GE-Springfield) and the M16A1 rifle (Harrington and Richardson).

(U) Numerous changes in ammunition modernization and production support facilities projects produced a net increase of \$4.1 million in the final AMC Facilities program. There were project deletions and reductions as well as project increases and late starters.

(U) Project deletions and reductions included two expansion projects for load, assemble, pack and metal parts for the 105mm, HE, M444E1 cartridge, amounting to \$4.6 million. DCSLOG eliminated a project \$2.1 million for design of a nitroguanidine

(U) Project increases and late starters added to the program. MUCOM converted eight planned Fiscal Year 1972 Manufacturing Methods and Technology (MM&T) projects to Fiscal Year 1971 late start PEMS requiring funding of \$3.4 million. Another \$3.4 million were added by seven late start projects. The most important of these were the MM&T Modular Synthetic Camouflage Screens at (MECOM); the Military Adaption of Items, Components and Assemblies for MUST Shelters at MECOM; the APE Heavy Equipment Transporter XM746/XM747 at TACOM; and the APE 20mm Rapid Fire Weapon System Interim (Ammo) at WECOM.

FY 71 PEMA PROGRAM - PRODUCTION BASE

BREAKOUT OF FY 71 PROGRAM BY PROJECT TYPE
(AS OF 30 JUNE 1971)

<u>PROJECT TYPE</u>	<u>AMC PROGRAM</u>		<u>APPROVED</u>		<u>IN PROCESS</u>		<u>TO BE SUBMITTED</u>	
	<u>NO</u>	<u>\$ MIL</u>	<u>NO</u>	<u>\$ MIL</u>	<u>NO</u>	<u>\$ MIL</u>	<u>NO</u>	<u>\$MIL</u>
	FY 71							
<u>FACILITIES</u>								
EXPANSION								
SUPPORT	50	\$55.4	48	\$54.8	2	\$.6		
MODERNIZATION	<u>21</u>	<u>129.6</u>	<u>19</u>	<u>125.8</u>	<u>1</u>	<u>.7</u>	<u>1</u>	<u>\$3.1</u>
SUBTOTAL	71	\$185.0	67	\$180.6	3	\$1.3	1	\$3.1
<u>LAYAWAY</u>								
SUBTOTAL	61	\$22.5	61	\$22.5				
<u>PROD ENGR MEAS</u>								
APE/MACI	42	\$62.1	42	\$61.8			<u>3</u>	<u>\$.3</u>
MM&T	<u>91</u>	<u>26.5</u>	<u>88</u>	<u>25.1</u>			<u>3</u>	<u>1.4</u>
SUBTOTAL	133	\$88.6	130	\$86.9				\$1.7
TOTAL FY 1971	<u>265</u>	<u>\$296.1</u>	<u>258</u>	<u>\$290.0</u>	<u>3</u>	<u>\$1.3</u>	<u>4</u>	<u>\$4.8</u>
PERCENT				(97.9%)		(0.5%)		(1.6%)
				<u>CARRYOVER</u>				
TOTAL VALUE		\$107.3		\$95.1		\$6.1		\$6.1
				<u>FY 71 PLUS CARRYOVER</u>				
GRAND TOTAL		<u>\$403.4</u>		<u>\$385.1</u>		<u>\$7.4</u>		<u>\$10.9</u>
PERCENT				(95.5%)		(1.8%)		(2.7%)

(U) The above breakout of the Fiscal Year 1971 program by project type shows that the total of \$296.1 million involved 265 projects. As of 30 June 1970, AMC had received 258 project of approvals for \$290.0 million. This was 98 percent of the Fiscal Year 1971 program.

US ARMY MATERIEL COMMAND
FY 71 PRODUCTION BASE SUPPORT PROGRAM

TOTAL, APPROVED AND RELEASED PROGRAM

(AS OF 30 JUNE 71)

COMMAND	TOT PROG			APPD PROG			REL TO MSCs	AWDS	% AWDS	AWDS OBJ %
	FY 71	C/O	TOTAL	FY 71	C/O	TOTAL				
AVSCOM	\$5.6	\$2.2	\$7.8	\$5.6	\$2.2	\$7.8	\$6.1	\$5.5	90	87
ECOM	3.5	10.9	14.4	3.5	10.9	14.4	14.3	14.3	100	82
MECOM	3.0	1.3	4.3	3.0	1.3	4.3	4.3	3.0	70	85
MICOM	4.8	8.4	13.2	4.8	8.4	13.2	13.2	13.1	99	98
MUCOM	210.0	67.7	277.7	204.2	55.5	259.7	256.1	235.1	92	91
TACOM	44.2	6.6	50.8	43.9	6.6	50.5	50.5	48.7	96	88
WECOM	21.4	9.6	31.0	21.4	9.6	31.0	30.9	28.1	91	88
OTHER	3.6	.5	4.1	3.6	.5	4.1	4.1	4.0	98	95
TOTAL	\$296.1	\$107.2	\$403.3	\$290.0	\$95.0	\$385.0	\$379.5	\$351.8	93	90

(U) The above chart shows the awards goals of each of the major subordinate commands. With the exception of MECOM, all of the MSCs exceeded their goals. ECOM awarded 100 percent of their released program. This attested to the success of their policy of eliminating programs which could not be placed on contract.

(U) During Fiscal Year 1971, three significant improvements in program execution and management were worthy of mention. The first of these was the submission to DCSLOG for ASD(I&L) for approval by

23 December 1971 of all 35 ammunition facilities projects of \$1.0 million. This action, praised by Mr. V. A. Huggard, acting Assistant Secretary of the Army (Installations and Logistics), provided for the implementation of the full Fiscal Year 1971 Production Base Program before the end of the fiscal year.

(U) The second improvement was the creation and publication of a milestone chart³ which systematically integrated key actions in the development cycle for facilities projects. Essentially, this chart expedited the process engineering and development of prototype equipment under the Manufacturing Methods and Technology (MM&T) program by two to three years. This would permit early development of pilot line processes for the modernization plan. Also, it would facilitate the preparation of concept design criteria and submission of projects for firm construction estimates to support AMC's for Fiscal Year 1974 budget request. The milestone chart had an impact on the Fiscal Year 1972 and Fiscal Year 1973 programs by advancing key development actions as part of a phased plan.

(U) Finally, the third improvement was the introduction of an omnibus project in the Fiscal Year 1972 program which would provide MUCOM contractor-operator with a continuing source of funds for the preparation of detailed functional criteria. This would allow completion of process engineering without a break in effort and would provide the District Engineers with data on a timely basis for final construction design.

3

AMCRP-01P letter, dated 29 July 1970, subj: PEMA Production Base Support Program Milestone Chart-PROMAP-70.

Defense Materials System (DMS)

(U) During Fiscal Year 1971 the steady decrease in materiel requirements for Southeast Asia combat activities caused the decline in allocations of authorized controlled materials by AMC to Defense contractors. There were indications that part of the decrease in allocations was due to certain defense manufacturers failing to place authorized material orders with primary producers as required by the rules of the DMS.

(U) Comparison figures between Fiscal Year 1971 and Fiscal Year 1970 for the four major groupings of materials which comprised about 80 sub-classifications follow: steel allocations decreased from 1,541,554 tons in Fiscal Year 1970 to 1,247,850 tons in Fiscal Year 1971; copper dropped from 231,565,050 pounds to 166,740,366 pounds; aluminum decreased from 189,985,076 pounds to 1,39,833,927 pounds; and nickel alloy went from 242,104 pounds to 93,255 pounds.

(U) The above trend was, also, evident in the number of requests favorably acted upon by AMC Headquarters for Special Priorities Assistance received from major subordinate commands and other agencies. They declined drastically from 185 in Fiscal Year 1970 to 21 in Fiscal Year 1971. The dollar value of the items for which priorities assistance was requested amounted to \$2,914,460 as compared to \$9,565,571 in the previous year. Of the 21 requests approved, 14 were for component items or sub-assemblies; six were for materials; and one for production equipment.

(U) With an overall estimated delinquency rate of 8 to 10 percent of Army contracts, the receipt of only 21 requests was believed to be abnormally low. This matter was discussed at compliance reviews on

DMS training sessions. The low level of requests for assistance could have been attributed to the lessening emphasis on DMS activities by Government agencies and to the attrition of knowledgeable personnel in industry. The nation's economic slowdown during Fiscal Year 1971 also could have been a factor.

Production Equipment Agency (PEQUA)

(U) During its seventh year of operation, PEQUA continued to provide engineering and technical assistance to Headquarters, AMC, and the major subordinate commands concerned in the management of the layaway of industrial plant equipment programs, and the streamlining the manufacturing methods and technology program. Additionally, the Agency provided professional and technical assistance for the execution of the industrial readiness planning and the industrial readiness assurance program.

Projects

(U) During Fiscal Year 1971, 181 new MM&T projects were funded, 49 were completed and 368 were continued. The new five-year plan showed that about 528 areas of work would require further study at a funding level of approximately \$86 million.

(U) Accomplishments during this period resulted in various areas including the small arms projects. Of importance was the new high speed method of small arms ammunition manufacture which was accelerated through the efforts of the PEQUA small-arms representative. Prototype case manufacturing equipment was being developed and made available for testing in February 1972. Cap, primer, assembly and loading lines,

also, were being developed which will revolutionize ammunition manufacture.

(U) The spiral level year project was another endeavor showing promise. A PEQUA engineer who served as a contracting officer's representative at TRW, intensively managed new techniques for precision forging of complex gear shapes. This work on precision forging was technically successful in achieving the desired configuration. Preliminary evaluation indicated that the precision method would be less expensive.

(U) Prepared at PEQUA but contracted through AVSCOM, the transport armor production process was an attempt to meet the military needs for a lightweight transport armor at a reasonable cost. This product was needed for helicopter pilot protection, tank vision blocks, and armored vehicle windshields. Single crystals of aluminum oxide produced in a gradient furnace were made to a diameter of six inches, and showed promise of achieving large diameters.

(U) These projects represented some of the many that were advancing the art of producing complex items for the Army. They provided a broader production-base, permitted qualification of additional sources, and resulted in lower unit cost and higher production rates.

Plans and Programs

Funding

(U) The operating programs for wholesale secondary items and repair parts for Fiscal Year 1971 were subjected to reprogramming

actions from the initial submissions in September 1970. Below is shown the initial AMC request for wholesale Army Stock for Fiscal Year 1971. Also, presented for comparative purposes are the initial Office, Secretary of Defense/Office, Management Budget (OSD/OMB) approved program against this request, plus the final OSD/OMB program.

	<u>AMC Request</u>	<u>OSD/OMB Approval (In Millions)</u>	<u>Final OSD/OMB Approved Program</u>
Sales	\$1,284.9	\$1,048.7	\$807.3
Obligations	1,040.9	761.1	453.1
Peacetime Stocks	(989.1)	(721.5)	(433.8)
(Prov)	(51.8)	(39.6)	(19.3)

(U) The extreme differences from the initial request to the final approved program reflected the ability of the customers to order from the National Inventory Control Point (NICP's) within the customer's approved funding plans.

(U) Management Problems. During Fiscal Year 1971 management problems were encountered in the computation of administrative lead time (ALT) at TACOM. OSD generally prescribed that for budget purposes, ALT could exceed three months. This posed a funding problem when actual ALT exceeded this prescription. DA permitted a test at TACOM on specified items to measure actual ALT and develop an analysis of the funding impacts when using true ALT versus using a limited three month ALT.

(U) Another problem that surfaced during this period was in the area of demands against, and sales from, excess oversea stock. Under SIMS/ABF procedures, an NICP directed shipment from oversea stocks

to satisfy a demand placed on the NICP. In accordance with procedures then in effect the NICP recorded a demand for an item, requested shipment, and after shipment recorded a sale against the account of the shipping oversea command stock fund. This had a deleterious effect on the demand base for requirements computation at the NICP, and on the sales base for Army Stock Fund programming and budgeting. Action was taken to submit this problem to the Department of the Army for resolution.

PEMA Scoreboard

(U) The PEMA Scoreboard was established as a method of review, analysis and management of the execution of the PEMA awards. It incorporated several features aimed at early recognition and early solution of award problems. The principal feature was the intensive participation by DRP division chiefs coupled with monthly reviews. These reviews were presented to the Director of Requirements and Procurement shortly after the end of the month; to the Deputy Commanding General for Materiel Acquisition and to AMC staff group and ASA(I&L), semiannually. The award performance for Fiscal Year 1971 was \$4.3 billion against a released program of \$4.9 billion. This represented an award percentage of 89 percent, the highest rate of achievement on record.

Problem Hardware Items

(U) The subject of problem hardware emerged in May 1969 when commodity commanders became concerned over hardware items that created problems after they were issued to the field. AMC decided to maintain full visibility over those items being held in depots and items in the

hands of contractors and ready for issue.

(U) This control was accomplished by assigning the problem items to the pertinent commodity division and item manager. A quarterly status report to AMCQA, and a monthly progress report to the Director of AMCRP were required.

(U) There were six commands with problem hardware items-ECOM, MECOM, MUCOM, TACOM, WECOM, and AVSCOM. It was projected that by the end of Fiscal Year 1971, there would be approximately 60 items worth \$450 million classified as problem hardware.

Defense Materiel Utilization Program (DMUP)

(U) As a result of the stratification of their inventories, DMUP required the ICP's within DOD to submit, at least quarterly, their computed requirements and potential long supply assets to DLSC for mechanical screening. When a machine match by FSN occurred (to include interchangeable and substitute data), an offer was made to the requiring ICP. The ICP reviewed his need at that time for the item, and the assets were either accepted or rejected.

(U) The results of offers made to the NICP's by the other military services and offer acceptances increased from 37 percent in Fiscal Year 1970 to 55 percent in Fiscal Year 1971. This was an 18 percent improvement despite the reduction in offers from the services. Assets received in Fiscal Year 1971 were valued at \$20.24 million compared with the \$12.99 million received in Fiscal Year 1970.

(U) Over 15,000 items valued at \$25.59 million were requested from the other services, of which 9,635 items, valued at \$13.75 million, were shipped. In Fiscal Year 1971, shipments increased to 60 percent as

compared with 56 percent in Fiscal Year 1970. While the Army's shipment rate was the highest of all services the denials were the lowest.

(U) Significant improvement was evident in unprocessed offers and shipments in backlog over 45 days. The backlog of offers was reduced from 3,084 to 311 while the backlog in shipments dropped from 1,437 to 214.

Procurement Policy

Government Property Provided Contractors

(U) In Fiscal Year 1971, AMC directed the US Army Procurement Research Office to make a study to determine the impact of the DOD facilities phase-out program of the Army's procurement posture. This study was known as PRO Project 71-2.

(U) The study disclosed the maximum dollar value of potential facilities phase-out activity was estimated to be \$328,000,000. This represented 11 percent of the three billion dollars of facilities held by Army contractors. Of the amount scheduled for phase-out, \$320,900,000 represented land, utilities and buildings. From the initial report from the Procurement Research Office, it was determined that the phase-out program would not have a serious impact on the Army. AMC, also, participated in review and comment to the ASD(I&L) in proposed legislation that dealt with the phase-out.

(U) Introduced by Congressman Gubser, Committee on Armed Services,
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the sales bill would help support the phase-out program. Also, it would reaffirm the policy that it would be in the interest of the public for DOD to divest itself to the maximum practicable extent

of its large inventory of Government-owned production equipment located in contractor-owned facilities. The legislation would authorize military heads, under GSA regulations, to sell at fair and reasonable prices, Government-owned production equipment to a contractor or subcontractor at whose facility the equipment was located.

Procurement Volume and Trends

(U) Total procurement dollars awarded under contracts during Fiscal Year 1971 declined for the third consecutive year. It amounted to \$4,517.8 million compared to \$6,121.7 million for Fiscal Year 1970 and \$8,806 million for Fiscal Year 1969. The peak volume of AMC procurement was reached at the height of expedited support of Southeast Asia (SEA) operations in Fiscal Year 1968 at \$9,874 million. Fiscal Year 1971 procurements represented a reduction of 54 percent from the peak in Fiscal Year 1968, and slightly more than the \$4.0 billion awarded in Fiscal Year 1965 during the pre-SEA era. The decline for Fiscal Year 1971 amounted to 26 percent of dollars awarded in Fiscal Year 1970.

(U) This declining trend in procurement dollars was accompanied by a similar reduction in terms of procurement actions from 635,135 in Fiscal Year 1970 to 603,968 in Fiscal Year 1971. Actions of a value of \$10,000 or more declined from 25,628 in Fiscal Year 1970 to 21,961 during this fiscal year.

(U) During Fiscal Year 1971, AMC awards amounted to 52 percent of total Army procurements of \$8.7 billion, a considerable change from the 75 percent ratio in Fiscal Year 1968 of Army awards of \$13.0 billion. About half of this change in ratio between AMC and total Army

procurements was attributable to funding of the Safeguard Anti-Missile system formerly the responsibility of AMC, but now under the direct control of the Department of the Army.

Competitive Procurement

(U) During Fiscal Year 1971 contract awards on the basis of price competition (including formal advertising) increased to 39.2 percent of total procurement dollars of \$4.518 billion. This performance continued the improvement noted in Fiscal Year 1970 which rose to 38.5 percent from an AMC all time low of 25.1 percent in Fiscal Year 1969. The improved performance was attributable to a decline in placing procurements on a near-crash basis in support of SEA operations. Another important factor creating a favorable atmosphere for increase in competitive procurements was the general overall significant reduction in appropriations for acquisition of defense materiel. Competition for available procurements had become extremely keen.

(U) As shown below, competitive procurement improvements were made in all commodity areas, except in weapons and combat vehicles.

<u>Commodity</u>	<u>Fiscal Year 1970</u>		<u>Fiscal Year 1971</u>		<u>Percent Change</u>
	<u>\$ Compet</u>	<u>Percent</u>	<u>\$ Compet</u>	<u>Percent</u>	
Aircraft Spares	72.6	8.9	77.2	15.9	+7.0
Missiles	62.9	11.9	84.4	16.0	+4.1
Weapons	124.7	56.5	58.0	49.2	-7.3
Ammunition	806.0	36.3	600.0	39.2	+2.9
Electronics	230.7	30.9	196.2	34.0	+3.1
Combat Vehicles	228.6	57.4	181.8	45.9	-11.5
Non-Combat Vehicles	485.3	88.5	363.8	90.4	+1.9

(U) The AMC established Fiscal Year 1971 target to award 40 percent of procurement dollars competitively was not attained by a fraction of a percentage point. However, since the main objective was to obtain an improvement in performance from year to year, the total competitive achievements in Fiscal Year 1971 were considered acceptable.

Formal Advertising

(U) Procurement dollars placed by formally advertised procedures during Fiscal Year 1971 amounted to \$893 million or 19.8 percent of all contract dollars of \$4,518 million. This was a significant improvement over Fiscal Year 1970 when performance under formal advertising registered at 16.9 percent of all procurement dollars.

(U) Listed below are the AMC subordinate commands showing percentage increases in formal advertising.

<u>Command</u>	<u>FY 1970 Percentage</u>	<u>FY 1971 Percentage</u>	<u>Percentage Change</u>
Aviation Systems	6.5	8.2	+1.7
Electronics	21.4	29.6	+8.2
Munitions	5.6	9.3	+3.7
Tank-Automotive	65.9	66.2	+0.3
Test & Evaluation	7.3	7.5	+0.2

Cost-Plus-Fixed-Fee Contracts

(U) The value of contractual actions awarded during Fiscal Year 1971 under Cost-Plus-Fixed-Fee (CPFF) financing arrangements totaled \$718 million which was 16.7 percent of total procurement dollars placed under contracts. This represented a less favorable performance than in Fiscal Year 1970 when CPFF contract dollars amounted to 15.2

percent of total procurements (actions of \$10,000 only).

(U) As in the past years, funding of GOCO ammunition plants represented the hard core of CPFF dollars under contracts or 52 percent (\$376 million) of total CPFF awards. This is actually an improvement over Fiscal Year 1970 when such GOCO CPFF awards amounted to 65 percent of all CPFF dollars. During Fiscal Year 1971, a significant increase was caused by new awards by TACOM of over 53 million for development and engineering services for the XM803 Main Battle Tank, 152mm (GMC) on a CPFF basis. The impact of this action alone increased total CPFF performance by more than a percentage point.

(U) Although the AMC target of under 14 percent was not realized, total performance in this area was considered acceptable.

(U) Below is listed the CPFF performance for Fiscal Years 1970 and 1971.

	Total Dollars Placed* Under Contracts (\$ Mil)	Total Dollars* CPFF (\$Mil)	Percent CPFF
Fiscal Year 1971	\$4,302.1	\$718.4	16.7
Fiscal Year 1970	\$5,880.3	894.1	15.2

*Procurement over \$10,000 only

Letter Contracts

(U) A significant reduction in the number of new letter contracts took place during Fiscal Year 1971. This was made possible by the continued application of previously established controls over the use of letter contracts by AMC procurement activities together with a more stabilized procurement program.

(U) At the beginning of this fiscal year there were 43 letter contracts on hand valued at \$161.9 million. Of these, three were

overage and valued at \$36.4 million. Through the year a total of 95 new letter contracts valued at 273.1 million were initiated. At the end of the fiscal year there were 25 letter contracts outstanding, valued at \$79.5 million. Of these only one, valued at \$53.8 million was overage.

(U) The above performance compared favorably with the assigned Fiscal Year 1971 DA goals of having not more than \$200 million in letter contracts outstanding, and not more than \$75 million overage.

Incentive Contracts

(U) Procurement dollars placed during Fiscal Year 1971 under contracts with incentive features amounted to \$575 million. The number of incentive contracts funded during the year in increments exceeding one million dollars, both initial and continuations of prior year contracts amounted to 84. This figure was down from 90 such contracts in Fiscal Year 1970 and 135 in Fiscal Year 1969. The proportion of Fiscal Year 1971 procurement dollars under contracts subject to incentive provisions declined slightly to 12.7 percent of total value of all awards in Fiscal Year 1971. Incentive contracts comprised 12.8 percent of the total procurement dollars (\$6,122 millions) in Fiscal Year 1970 and 15.6 percent of all awards (8,806 millions) in Fiscal Year 1969.

Multi-Year Procurements (MYP)

(U) The reduction in value of the Fiscal Year 1971 procurement program was, also, reflected in the procurement dollars awarded by the use of the multi-year technique. From a peak of \$751 million awarded under MYP contractual arrangements in fiscal year 1970, multi-year

procurements declined to \$582 million in Fiscal Year 1971. The Fiscal Year 1971 MYP was still about \$20 million more than awarded under similar arrangements in Fiscal Year 1969, which was the next highest performance since Fiscal Year 1963. The downward trend was expected since MYP contracting was not appropriate in times of cutbacks in procurement programs and uncertainties of requirements for the following years.

(U) Sixteen new MYP contracts were awarded during the year, obligating \$95.6 million for the first year's increments. This compared to \$181 million under new contracts in Fiscal Year 1970. An additional \$486.2 million was awarded during Fiscal Year 1971 under 52 existing MYP contracts for requirements.

Battlefield Command and Control Systems

The Army Satellite Communications Program

(U) The US Army Satellite Communications (SATCOM) Program was under the control and direction of an AMC Project Manager who also served as the Commanding Officer, USA SATCOM Agency, Ft. Monmouth, New Jersey.

(U) As SATCOM Project Manager, he managed six programs, including the Defense Satellite Communications Program (DSCP), Tactical Satellite Communications (TACSAT), NATO Tactical Satellite Communications (NATO TACSAT), Navigation Satellite (NAVSAT), Meteorological Satellite (METSAT), and SATCOM Exploratory Development.

(U) During Fiscal Year 1971, DSCP was in operational use by the Defense Communications Agency, with the Army supporting the world-wide

deployed terminals. Phase II was to involve more powerful Air Force procured satellites in synchronous orbits. Concurrently, the Army was to modify earth terminals; develop new ones; devise and install the communications control subsystems; develop and field a completely digital communications systems; and test the deployed system for operation with the new satellites.

(U) TACSAT system achieved international space program prominence when it successfully supported APOLLO 10, 11, and 12 recoveries. Additionally, it supported Presidential missions and world travels. For this program, the Army fabricated (in-house), five terminals, which were used in initial feasibility demonstrations. As a follow-on effort, the Army, Navy, and Air Force jointly procured a total of 65 terminals. These terminals were tested and subjected to limited operational use in Fiscal Year 1971.

(U) On 27 May 1970, the Deputy Secretary of Defense granted approval for the initial state of Phase II, DSCP. This enabled the Air Force to contract for the Phase II satellites. The Army initiated development, by contract, of the heavy transportable and medium transportable terminals, and embarked upon a major modification of the existing terminals.

(U) Phase I of this project called for the installation of a communications system, known as the Hankam Net, for the top levels of the military structure in Indonesia. It was mandatory that the system be completed and turned over to the Indonesia Government by 1 June 1971.

(U) The Department of the Defense assigned on 11 December 1970 the Army as the single manager for the implementation of this project.

This was followed by the Department of the Army naming on 18 December 1970 the Commanding General, USASTRATCOM, as the program manager. This tasking specified that "it is essential that the 1 June 1971 target for Phase I be met."

(U) In conjunction with the US Defense Liaison Group in Indonesia and representatives of the Indonesian Government, USASTRATCOM representatives soon made site survey visits and attended to details with respect to equipment configuration. On 9 February 1971, a procurement package for the Hankam Net was completed and turned over to USAECOM for procurement.

(U) After a review, it was determined that a negotiated competitive contract could not be made in time to meet the mandatory date of 1 June 1971. Only three of the 12 potential contractors expressed an interest as prime contractors. Following a review and evaluation of the proposals of each of the three, Collins Radio was selected as the contractor. Accordingly, a letter contract was awarded on 18 February 1971 to Collins Radio by USAECOM.

(U) Weekly reports from the contractor to the Army Communications Systems Agency (ACSA), and biweekly reports from ACSA to AMC were established for control purposes. As a result of close coordination and effective follow-up by the contractor and elements of the Army, the Hankam Net was completed and ready for turnover on 31 May 1971. It was actually turned over to the Indonesian Government at formal ceremonies on 2 June 1971.

Weapons and Munitions

Ammunition Production Base

(U) The deescalation of hostilities in Vietnam caused substantial reduction in fiscal year ammunition requirements. Of the 25 GOCO plants operated in support of Vietnam, five were phased out of production and the remaining 20 operated on a reduced schedule. Accordingly, this resulted in a substantial reduction of personnel.

(U) The recession in the Nation's industrial economy acted as a stimulant to intensify price competition for the shrinking ammunition procurement program. This resulted in the elimination of some existing production base contractors. The impact of these economic factors acted to create numerous congressional inquiries on behalf of constituent's requesting explanations for the reduction in ammunition production, and loss of employment.

PEMA Program and Awards

(U) Fiscal Year 1971 total planned PEMA program was \$2,287 million of which \$2,269 million was released to MUCOM. Cumulative awards through 30 June 1971 amounted to \$2,106.4 million or 93 percent of awards executed against the planned program. Again, the Vietnamization of the Southeast Asia conflict was reflected by lower Fiscal Year 1971 congressional military appropriations. A comparison of program awards shows a 29 percent decrease from that of Fiscal Year 1970 which totalled \$2,958 million.

Procurement of Ammunition

(U) The President's budget requested an Army procurement program of \$1,733.6 million. However, as a result of the reductions in SEA

and training requirements, and a policy change which resulted in instituting a full funding concept for production engineering and quality assurance costs, the Fiscal Year 1971 Army program was reduced to \$1,147.6 million.

The total value of the procurement programs for Fiscal Year 1971 was \$2,013 million. Below is a breakdown:

	<u>FY 1971</u> <u>Millions</u>	<u>Prior Year</u> <u>Millions</u>	<u>Total</u> <u>Millions</u>
Army	\$1,147.6	\$286.5	\$1,434.1
Other Customers	\$ 473.9	\$105.0	\$ 578.9
Total	\$1,621.5	\$391.5	\$2,013.0

(U) At the end of this fiscal year, awards against the total program amounted \$1,871.3 million, or 93 percent of the total program. Thus the AMC objective of 93 percent was attained.

Procurement Actions and Policy Review

(U) In September 1970, Olin Corporation complained that they were not offered a fair share of the 20mm ammunition loading requirement for their Kingsbury plant, La Port, Indiana. In previous years the practice had been to allocate 16,000,000 rounds to Olin Corporation and place the larger balance in Lake City Army Ammunition Plant, Independence, Missouri. But in Fiscal Year 1971 Olin was offered 10,000,000 rounds while approximately 28,000,000 rounds were planned for the Lake City Plant. Deputy Assistant Secretary (I&L) Vincent P. Huggard became concerned that the procurement practice had been to arbitrarily allocate quantities of some commodities to sole sources in industry without competing procurement when similar capacity existed in Government Owned-Contractor Operated Plants.

(U) Finding no policy provision for procuring and competing privately owned sources with government owned sources, Mr. Huggard directed that a policy be developed for Fiscal Year 1971 implementation. Consequently, the ASA(I&L) issued on 27 October 1970 an ammunition procurement policy directed toward competing the two sources. AMC took some exceptions to the policy, and on 12 January 1971 the ASA(I&L) made revisions to accommodate AMC views. Essentially, the new policy was that where there was similar capacity, the private sector and the GOCO plants would be competed on an out-of-pocket cost, provided appropriate production base considerations were protected. However, a memorandum dated 8 January 1971, from Mr. Packard, Deputy Secretary of Defense, in practice negated the implementation of the new policy for Fiscal Year 1971. It directed that active base production sources be given up to six months advance notice to allow unsuccessful contractors time to prepare for other business opportunities.

(U) Working procedures were revised to comply with the pertinent guidance from both ASA(I&L) and OSD. Upon their approval, the new procedures were to be applied in the Fiscal Year 1972 and subsequent procurements.

AK 47 Rifle 7.62MM X39MM Ball Ammunition

(U) In July 1970, AMC was directed by DA DCSLOG to procure 3,000,000 rounds of 7.62 MM X39MM ball ammunition for the AK 47 rifle. This special SEA requirement called for deliveries of 1,000,000 each in August, September and October 1970. Authorization for production of the AK 47 ammunition was granted under the congressional approved Foreign Aid Program.

(U) A formal research and development program had not been instituted for this item hence there was no technical data package available. As the round had never been produced in the United States, off shore sources were unsuccessfully pursued. An importing firm, Interarms Co., Inc., was requested to acquire 3,000,000 rounds, but it was able to provide only 500,000 rounds during July 1970. Consequently, Lake City Army Ammunition Plant was queried about its potential production capability. Remington Arms Co., Inc. the contractor at Lake City AAP was given an order of 27,000,000 rounds with the delivery of 6,000,000 rounds in October 1970. The production effort, an innovation, included reserve engineering, design of the cartridge, tooling, modification of production equipment, and the acquisition of a special non-standard propellant as well as the assignment of key engineering and production personnel to the task.

(U) In September 1970, DA DCSLOG requested an increase in the October 1970 production rate to 8,000,000 rounds to be followed thereafter by a monthly rate of 7,000,000 rounds. The increased quantity for production of this ammunition was required to meet urgent combat demands of the Cambodian Forces. This goal was achieved with an all-out effort on the part of governmental agencies and the private contractors. Actually only 6,030,000 rounds were accepted in October 1970 as total acceptance was held in abeyance pending shipping instructions.

(U) The production rate of the AK 47 ammunition was again increased in January 1971 to 9.5 million rounds per month. No problems were anticipated in meeting the deliveries scheduled to complete the

Fiscal Year 1971 program requirements for the AK 47 rifle ammunition. The overall cost of this all-out engineering and production achievement was estimated to be only slightly higher than the cost of producing similar US cartridges which were supported by fully documented technical data packages.

Gas Mask M17

(U) A reported deficiency in the M13/M13A1 filter element used in the M17/M17A1 protective field gas mask prompted MUCOM to initiate in December 1970 an investigation. During the later part of December 1970 and early January 1971, MUCOM provided additional information relative to the confirmation of the deficiency. Plans and programs were initiated to provide for necessary corrective actions. Due to the overall magnitude and readiness implications of the problem, a project coordinator, Colonel Joseph C. Hiett, was chosen to monitor the program at AMC Headquarters level. Additionally, a Project Coordinating Group representing AMC directorates responsible for actions was established to jointly assist in monitoring the MUCOM program.

(U) During the period of January through June 1971, the testing and product improvement programs required to confirm the deficiency, identifying the problem, and initiate corrective measures were underway. Progress continued at an acceptable rate and consideration was given to accelerating the product improvement program and the concurrent quick-fix procurement program.

(U) The target date for the completion of the product improvement program was January 1972, and the procurement of the improved item commenced shortly thereafter. Due to his reassignment on 18 June 1971

Colonel Joseph C. Hiatt was replaced by a new project coordinator, Colonel Arthur R. Rausch.

Weapons Development and Acquisition

(U) During Fiscal Year 1971 the Army contracted for the development and acquisition of certain weapons. This was in keeping with the Army's effort to maintain its mobilization readiness mission. Included among these was the contract for the purchase of a quantity of M16A1 rifles.

(U) M16A1 Rifle. This was a commercially developed weapon. It was a lightweight air-cooled, gas operated rifle which was fed from a 20/30 round magazine. The rifle could be fired fully automatic or semi-automatic at a cycle rate of approximately 800 rounds per minute.

(U) A contract was let in October 1971 to Colts, Inc. for 254,238 M16 rifles at a rate of 20,000 rifles per month through May 1972. Previously, Harrington and Richardson completed production of 240,000 in March 1971, and the Hydramatic Division of General Motors Corp. completed production in June 1971 of 479,000 rifles.

(U) Grenade, Launcher 40mm, M203. This item was a lightweight, compact, breech-loading, pump-action, single-shot, manually operated weapon. It was used in conjunction with the M16/M16A1 rifle and capable of firing the standard family to 40mm ammunition. The M203 replaced the M79 grenade launcher.

(U) A multi-year contract was let with Colt's, Inc. for 67,800, M203 grenade launchers. The agreement called for the delivery of 17,800 in Fiscal Year 1971; 20,000 in Fiscal Year 1972; and 30,000 in Fiscal Year 1973 with an option to increase the Fiscal Year procurement

to 60,000.

(U) Machine Gun, 7.62mm, M73A1. The M73A1 machine gun was a weapon with a short receiver, recoil operated with booster assist, and had left or right hand feed. It used 7.62mm NATO ammunition in the standard M13 link.

(U) During Fiscal Year 1971, the workload at Rock Island Arsenal (RIA) reached a level that seriously jeopardized WECOM's ability to maintain its mobilization readiness mission.⁵ The M73A1 machine gun was one of the items selected to be placed in production at RIA in order to retain certain skills and to maintain a viable work force at the arsenal. In April 1971, the Army placed at RIA a requirement for 975 guns at \$4 million. The machine gun, caliber .50, M85 was another item selected for production at RIA in order to maintain mobilization readiness.

(U) Machine Gun, Caliber .50, M85. This gun is a short receiver, air cooled recoil operated, .50 caliber weapon, specifically designed and developed for use in the interior of armored vehicles.

(U) Prior to Fiscal Year 1971 the M85 had been produced at the Springfield Armory facility by the General Electric Co. During Fiscal Year 1971, the decision was made to produce the M85 at RIA in order to maintain mobilization readiness and retain certain skills. The Fiscal Year 1971 requirement for 1,626 guns was placed in May 1971, and was valued at \$8 million.

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(U) Gun, 20mm, Automatic, M139. The M139 gun, an improved version of the Hispano Suiza HS820/L85 Gun, was procured from the Federal Republic of Germany to provide the US Army with a vehicle mounted interim weapon system capable of engaging and destroying low-flying, low-performance enemy aircraft as well as light enemy armor.

(U) A quantity of 2213 Command and Reconnaissance Carriers (M114A1) had been scheduled to be retrofitted with the M139 gun. However, due to the tank anti-tank studies, the program was changed so that only 1,818 vehicles were to be retrofitted, and 345 were to be placed in an undertermined category pending the outcome of the tank anti-tank studies. The status of this program showed that 401 vehicles were retrofitted in Fiscal Year 1970; 504 vehicles retrofitted in Fiscal Year 1971; and 913 remained to be retrofitted.

(U) During Fiscal Year 1971 a recommendation was made to establish a United States production base for the M139 gun and related ammunition. A cost and feasibility study was made based on the low level Armored Reconnaissance Scout Vehicle (ARSV) procurement. It indicated that, due to an ARSV production lead time of 30 months and a technical data package in January 1972 for the ARSV, a decision to establish production bases for the M139 and related ammunition could be deferred until Fiscal Year 1974.

Missile Systems

(U) The Fiscal Year 1971 Missile PEMA (Procurement of Equipment and Missiles, Army) program apportionment totaled \$329.9 million. After many program adjustments, the total release to MICOM was

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\$296.6 million. Of the total, \$17.2 million remained in the Fiscal Year 1971 deferred program (Hawk, \$12.0 million. Pershing \$4.0 million; and Shillelagh \$1.2 million). The Army customer approved program totaled \$19. million, most of which was for repair parts. Included in the total program figure was the carryover program for both Army and customer of \$50.2 million.

(U) TOW Weapon System. In Fiscal Year 1971 funds in the amount of \$108,748,334 were released to support the TOW weapon system. Of this amount, \$106,300,000 came from PEMA funds. Because of the reduction realized in the negotiations process of finalized contractual actions, the PEMA funds were later reduced to \$99.8 million. The PEMA funds covered production of the missile, launchers, training sets, vehicle mounting kits, battery chargers, as well as production base facilities and first destination transportation. Funds amounting to \$1,400,000 provided for continued research and development and test programs, while maintenance support and central services required \$1,048,334 in OMA funds.

(U) An extremely comprehensive test of the system was completed in September 1970. The confirmatory test of the TOW weapon system and comparison of TOW with the 106mm recoilless rifle was a combined program that tested the combat and operational effectiveness of one weapon to the other. It also provided electronics countermeasure vulnerability data. The final draft test report was submitted in October 1970 to Headquarters, Department of the Army, and was approved on 28 April 1971.

(C) A total of 1,783 production missiles were fired at moving targets located at various ranges between 65 and 3,000 meters, and

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at stationary targets, located between 350 and 3,000 meters. Nine firings were not tested for reliability, and only 112 system failures (launcher and missile) were experienced. Accuracy of 90.2 percent was achieved with 51 reliable firings not tested, and 159 accuracy failures.

(C) Distribution of the launchers to US Army, Europe, began in September 1970 and by 13 November 1970, its first unit was equipped. A combined training/equipage program provided for the equipage of three battalions per month. By the end of the year all 24 divisional battalions were equipped with six launchers per battalion. Beginning in July 1971 a second round of an additional six launchers per battalion were to follow.

(C) In January 1971, a partial distribution of 24 launchers was made to the 82d Airborne Division. This accelerated delivery schedule equipped three battalions of the 82d Airborne Division with the TOW weapon system.

(C) Foreign interest in TOW was widespread. The Federal Republic of Germany purchased a quantity of missiles to support an extensive test program. In July and August 1970, The Netherlands conducted an evaluation of the TOW weapon system at Redstone Arsenal, Alabama. That country procured 20 missiles and necessary support services for the above test. The Italian Government also procured 20 TOW missiles for a comprehensive firing program in Italy. A special firing demonstration was conducted by Italian crews for the Italian Army Chief of Staff with excellent results.

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(C) PERSHING Weapon System. The Command review of the PERSHING System/Program conducted on 14 July 1970 at Headquarters, AMC, indicated that the program was on schedule. It, also, indicated that the PERSHING program should proceed with missile and power station development program, testing and production. In accordance with the "fly before you buy" concept, the missile production was not to be initiated until the successful completion of five flight tests with missile incorporating the new components. Consequently, the Commander, AMC recommended on 6 August 1970 to the Chief of Staff, Army, that the program be continued and funded, and that the qualitative materiel requirements changes be approved. On 28 August 1970, the Vice Chief of Staff agreed with the AMC recommendation and stated that funds were programmed for the procurement of additional missiles.

(C) The Office SAOAS(I&L) approved on 28 June 1971 a determination and findings to perform work for the PERSHING system by contract in a total estimated amount of \$54,856,382. Procurement by negotiation was authorized for the purchase of missiles and related items, trajectory accuracy, accuracy prediction system, missile life extension, modification kits, and modification kits.

(C) LANCE Weapon System. During Fiscal Year 1971, the LANCE Weapon system moved from the development state to the production phase.

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Ltr, AMCRP-H 6 Aug 70, subj: PERSHING System Program Review.

7

Ltr, Vice Chief of Staff, USA, 28 Aug 70, subj: PERSHING System Program Review.

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1st Ind. SAOAS(I&L)-PO 28 May 71, subj: Request for approval of FY 72 Determination and Findings for the PERSHING Weapon System.

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The first production contract in the amount of \$14.2 million was awarded in January 1971. In the following April, the Government assumed configuration control and responsibility for the LANCE technical data package. Production model missiles, approximately 80, were being produced under the development contract, and were to be used for evaluation against the LANCE Qualitative Materiel Requirements during the engineering test service program that was scheduled to begin in August 1971.

(C) SHILLELAGH Weapon System. In December 1970, the Secretary of the Army was notified that the completion of the transition plan covering the termination of project management for the SHILLELAGH Weapons System had been accomplished. The Secretary of the Army approved a request for the termination of project management for SHILLELAGH, effective 30 June 1971.

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Ltr, Subj: Termination of Project Management for SHILLELAGH Weapon System, 8 February 1971.

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CHAPTER VI
LOGISTICS OPERATIONS
Formerly Operational Readiness (OPRED)

Organization and Mission

(U) The Directorate for Logistics Operations was responsible for maintaining continuous surveillance over all materiel requirements of the US field forces and of AMC's ability to respond to all programmed or mobilization requirements in a timely and effective manner. The Director served as the focal point for analysis of the logistic readiness of the Command and for coordination of actions required to correct imbalances or meet emergency requirements. Among his other duties were the following: serving as program manager for the AMC Installations Division of the Army Stock Fund; staff supervising the National Guard and Army Reserve representatives assigned to Headquarters, AMC; providing staff supervision over the AMC Logistic Assistance Offices in CONUS, and providing information to major commands concerning assignments of responsibilities within the AMC complex to facilitate direct contact on logistic matters.

(U) During Fiscal Year 1971, there were several changes in the structure of the AMC organizational components that were responsible for logistics operations. With the approval of the Headquarters, AMC, Table of Distribution on 5 May 1971, the Directorate for Operational Readiness assumed the new organizational title of Directorate for Logistics Operations (LOG OPs).¹ Several significant organizational

¹
Directorate for Logistics Operations Historical Summary, FY 1971, p. 2.

changes, both before and after this May 1971 event, should be traced.

(U) On 6 May 1970, the mission and functions of the Retail Stock Fund Branch, in the Installations Division of the Directorate for Installations and Services, were transferred to the Directorate for Operational Readiness (OPRED).² On 6 October 1970, two officer and two civilian spaces were transferred from OPRED to the Aviation Office, in order to establish that office.³ On 7 December 1970, the Secondary Item Support Branch, which served as the Home Office for AMC's Army Stock Fund Mission, was transferred from the Directorate for Requirements and Procurement to OPRED.⁴ At the same time, the position of Deputy Director, OPRED, was created. Effective 13 January 1971, OPRED⁵ was reorganized on a provisional basis.

(U) Further realignments in the organizational structure of OPRED followed. The Logistic Readiness Division and the Logistic Assistance Division were consolidated into the Logistic Assistance and Readiness Division. The Operations Center Branch of the Logistic Readiness Division became a part of the new Division's Administrative Office. The Supply Management Branch of the Logistic Readiness Division was consolidated with the Stock Fund Branch of the Operations Division. There were several other organization and personnel shifts, such as the transfer of select personnel of the Secondary Items Support Branch

2

AMC Manpower Authorization Voucher, 9 Jun 70.

3

DF, AMCPT-SM, 6 Oct 70, subj: TDA M1-WOGWWA-05.

4

VOCG, HQ, AMC to DCGLS, 4 Dec 70.

5

DF, AMCOR, 13 Jan 71, subj: Provisional Reorganization of the Directorate for Operational Readiness.

in the Directorate of Requirements and Procurement, to the Logistics Readiness Division in OPRED. Then, on 5 May 1971, OPRED assumed the new organizational title of Directorate for Logistics Operations.

(U) The authorized strength of the Directorate, under the new name, was 90--14 officers, 2 enlisted men, and 74 civilians. This was an increase of nine spaces over the prior authorization. The current Director, COL Robert L. Hall, had formerly served as the Special Assistant to the Deputy Commanding General for Logistic Support. He became Director of OPRED on 22 September 1970, succeeding COL William Boyer who was reassigned as Chief of the Aviation Office, HQs, AMC. In addition to his duties as Director, COL Hall served as Special Assistant to the DCGLS for Depot Complexing and as Deputy Program Monitor for the AMC Command Supply Discipline Program.

Army Stock Fund

Organization

(U) In January 1970, the Supply Management Branch of the Installations and Services Directorate was transferred to the Directorate of Logistics Operations. Later in the year, the Secondary Item Support Branch, which served as the Home Office of the AMC Army Stock Fund (ASF), was transferred from the Directorate of Requirements and Procurement to the Directorate of Logistics Operations. In May 1970, the functions of these two branches were combined and redesignated as the AMC Army Stock Fund Office.

6

AMC Special Order 182, para. 2, 30 Sep 70.

Mission

(U) The Army Stock Fund Office operated under a Stock Fund Charter issued by Department of Defense on 23 June 1964. The Office operated through nine subhome offices with 41 branch offices. The chief responsibilities included programing, budgeting, funding and related supply management activities. The ASF financed the procurement pipeline and inventories of secondary items, and repair parts stock fund operating supplies, materiel and equipment at class II installations under command of the CG, AMC, the Surgeon General, the CG, Strategic Communications Command and the CG, Army Security Agency worldwide. The missions supported included but were not limited to: depot operation, maintenance and rebuild; hospitals and medical centers; research and development; Army schools and centers; clothing sales stores; and subsistence commissaries and commissary sales stores. The inventories included all applicable operating and mobilization reserve stocks of materiel authorized to be financed within the 16 materiel categories assigned.

Stock Fund Operating Program

(U) The ASF operating budget, as initially submitted, proposed a program of \$340.2 million sales and \$338.8 million obligation authority. All phases of the planned program supported these estimates. The Office of the Secretary of Defense (OSD) and Office of Management and Budget (OMB) reduced the program to \$286 million sales and \$267 million obligation authority (OA). DA also imposed a quarterly limitation on

7

FY 1971 Initial Apportionment Request to DA, 20 Apr. 70.

obligation authority. OSD/OMB later increased the stock fund to
8
\$319.6 million sales and \$308.4 million OA.

(U) This increase was justified by firm workload data and actual sales accomplishment. In addition, the quarterly obligation authority was listed, which permitted more flexibility in operations.

Deactivations/Closures of ASF Branch Offices

(U) As a result of installation closures by DOD, several Army Stock Fund Branch Offices were closed and their mission transferred to other activities. These ASF branch offices were closed and their functions transferred as follows: Navajo Army Depot (AD) Branch and Fort Wingate AD Branch went to Pueblo AD; Granite City AD Branch went to Tobyhanna AD; Oakland Army Base (Commissary Store) was transferred to CONARC ASF; Chitose Station, Japan was transferred to the US Air Force; and Two Rock Ranch, California was transferred to the US Navy.

Transfer of Aircraft Maintenance Mission

(U) At a meeting in March 1971 at CONARC a memorandum of understanding was drafted on the transfer of the general support aircraft maintenance mission from AMC to CONARC. AMC had carried out this function in support of CONARC over a long period at the following five locations: Fort Hood, Texas; Fort Riley Depot, Kansas; New Cumberland Depot, Pennsylvania; Atlanta Depot, Georgia; and Sharpe Depot, California. Approximately 185 civilian employees at Ft Hood and Ft Riley, involved in providing general support aviation maintenance service were transferred to CONARC on 1 July 1971. AMC employees at New Cumberland,

8

DA msg., 2 Apr 71, DCSLOG-DFR-SFSID, subj: ASF Operating Program, FY 1971.

Atlanta and Sharpe performing general support maintenance functions
were retained by AMC to perform the AMC aircraft maintenance mission. 9

(U) The AMC ASF inventories located at Ft. Riley, Kansas and Ft. Hood, Texas which were under the accountability of Red River Army Depot, were decapitalized and transferred to CONARC ASF on 1 July 1971. Army Stock Fund assets at New Cumberland, Sharpe and Atlanta depots were not transferred to CONARC inasmuch as these assets could be utilized on depot maintenance overhaul of Army aircraft. 10

Commissary Operations

(U) In February 1970, the Chief of Staff, US Army, directed that steps be taken to improve service to commissary patrons as one means of enhancing Army service career attractiveness. This policy was implemented by providing additional manpower and resources. 11 In October 1970, the DA advised USAMC that a congressional query had been received regarding alleged stock shortages in the commissary sales stores. It was alleged that commissary stores could not replenish shelf stocks because of Command Stock Fund money shortages. The Department of the Army also advised the AMC that the congressional subcommittee on exchange and commissaries desired information on stores which could not

9
Ltr., AGAO-KL LOG, 4 Feb 71, subj: Transfer of the GS Aircraft Maintenance Mission from AMC to CONARC.

10
AMC Ltr., (AMCCP-FR), 24 Jun 71, subj: Transfer of the GS Aircraft Maintenance Mission from AMC to CONARC.

11
DA Msg., 18 Feb 70, Comptroller-B, subj: Operation of Laundries and Commissary Sales Stores.

stock brand name products at anytime during Fiscal Year 1970 because of funding constraints. A survey was made of 22 commissaries operated by the AMC. The result of the survey indicated that funding shortages and constraints had caused temporary stock outages in seven of the 22 commissaries. Outages did occur for periods of less than a month. These shortages were in cigarettes, soft drinks, dry foods, and other non-edible rather than subsistence items. In order to preclude further outages, the AMC advised Subhome Office Managers that obligational authority to support commissary sales should be released to commissary officers in the full amount of their approved program, and that problem areas in connection with commissary operation be immediately brought to the attention of AMC.

(U) There was considerable improvement in commissary store operation and facilities during Fiscal Year 1971. Operating personnel increased, the number of items stocked was increased and the commissary operating hours were changed from 48 to 54 hours per week.

Logistic Assistance and Readiness

(U) The Logistic Assistance and Readiness Division, which was established in April 1971, combined the former Logistic Readiness Division and the Logistic Assistance Division. The Table of Distribution of

12

DA msg, 22 Oct 70, DCSLOG-SD-TSD, subj: Congressional Inquiry Regarding Adequacy of Stock Fund for Commissary Operations.

13

CG, USAMC Memorandum for: All Personnel of HQ, AMC, subj: Realignment of HQ, 26 April 1971.

1 June allotted six officers and 25 civilian personnel to this division. The remainder of this chapter highlights significant worldwide logistics assistance operations.

Army Logistics Assistance Offices

(U) Col. C. C. Clifford, who had been assigned previously to Hq, US Army Europe replaced Col. J. F. Dougherty as chief of the Logistic Assistance Office, Vietnam. Lt. Col. J. N. Vinson replaced Lt. Col. L. Jensen as Chief of the Logistic Assistance Office, Korea. Lt. Col. H. H. Attaway was reassigned to the Ryukyus Logistic Assistance Office. The Logistic Assistance Office in Thailand was disestablished on 30 June 1971. Requests for assistance in Thailand were to be assigned to personnel in, or attached to, the Vietnam Office.

(U) During this fiscal year, the Director of Logistic Operations expanded the mission and functions of the Logistic Assistance Offices. The following functions were added: Direct Supply Support; monitorship of the Modification Work Order Program; Maximizing Value Code H Assets; and Selected Items Management (SIMS).

Keystone Robin Retrograde Team #5

(U) US Army Vietnam (USARV) message, in July 1970, requested the assistance of a technical assistance team to support troop deployments for a period of 180 days. After five days of orientation at Sharpe Army Depot, a team of 18 individuals departed for Vietnam on 17 August 1970. To better align the teams capabilities, two additional automotive technicians joined the team. Two packaging experts were returned to their home stations on 12 October 1970, after having completed their mission. The team's efforts were first centered on the 79th Maintenance

Battalion. In mid September 1970, a portion of the team was assigned to Long My Depot to aid in a recoup program. From mid-October to mid-September, one half of the team was deployed at the On Khe-Cha Rang Valley with the 4th Division, and the other half of the team were redeployed with the 25th Division at Long Binh.

(U) The return of the team members to their home stations began on 21 December 1970. All returned except one individual, who remained as a team number 6 member.

Keystone Robin (Charlie) Retrograde Team #6

(U) In November 1970, USARV requested the AMC to again provide a team of technicians to assist in the retrograding and recouping of equipment, as a result of troop withdrawal and redeployment. A team of seven members were requested to accomplish the mission at Long Binh. During phase #6, approximately 250,000 line items of equipment were processed. This included the following items: small arms--26,143; artillery--51; wheels--3,404; tracks--605; communications-electronics -----16,017; and construction materiel handling equipment--446. The balance of the line items consisted of DSA, GSA and TAT (to accompany troops) items.

(U) There was a definite need for a clear definition of the applicability of Technical Manual 750, Packing and Preservation Manual, to USARV. Many items were not properly packed to avoid damage during off-shore shipment. After the teams returned from Vietnam, USARV directed the use of TM 750 series manuals as guides for processing equipment for off-shore shipment. Team #6 members were released and returned to their home stations when they completed their individual

missions, commencing 23 February 1971. All team members had returned by 6 May 1971.

Landing Legs for M127 Trailers, Ryukyus

(U) Early in this fiscal year, the Logistic Assistance Office, Ryukyus advised the AMC that overhaul of M127 trailers had come to a halt because of the lack of landing legs. Headquarters, AMC personnel contacted Tank-Automotive Command personnel, which resulted in the release of a quantity of kits to satisfy immediate needs and the scheduling of other shipments for future requirements. AMC informed the Logistics Office, Ryukyus, that TACOM could supply 260 sets of landing legs by 15 August 1970 and 135 sets per month thereafter.

Storage of Tires in Vietnam

(U) During this year, the Logistic Assistance Office, Vietnam reported that the supply of 1100x20 tires had become critical. USARV had borrowed approximately 3000 tires from the 2nd Logistical Command and ARVN. Initially, 6,268 tires were airlifted to Vietnam the immediate shortage, 3,372 were expedited by surface vessel, and shipments of 1,000 per week continued until a total of 49,000 had been received.

DA Logistic Readiness Liaison Visits

(U) Pursuant to Army Chief of Staff direction, a team under the Deputy Chief of Staff for Logistics made annual logistic readiness liaison visits to major Army commands. These visits included CONUS Army Headquarters, divisions and major installations, US Army Europe, US Army Pacific, US Army Southern Command, and US Army Alaska, which were visited every two years.

(U) In view of the areas of AMC interest covered by these visits, DCSLOG invited the AMC to provide a team representative for each of these visits. The objectives of the logistic readiness team visits was to determine the effectiveness of the supply and maintenance teams. The teams also studied the following factors: the problems that delayed attainment of unit authorized levels of organization; sufficiency of DA authorized Army logistics directives; and availability and utilization of maintenance personnel.

(U) During Fiscal Year 1971, the AMC participated in the following DA liaison visits: to US Army, Alaska; Forts Hood and Bragg; Forts Dix, Devens and Meade; Fort Lewis and Fort Ord Reserve Components; 4th Army Headquarters, at Forts Sill and Sam Houston; Forts Eustis and Lee Reserve Components; US Army Forces, Southern Command; Fort Benning and Reserve Components, and Fort Hood and Reserve Components. Following these visits, AMC team members resolved the problems, in collaboration with other headquarters and commodity command elements. Essential mission equipment shortages to exist in certain units visited. Many units also experienced repair parts shortages. The most common maintenance problem was that of maintaining a favorable posture for M715 and M725 1½-ton trucks.

(U) These vehicles were intended to serve only during an interim period pending availability of the next generation vehicle. Cyclic overhaul was not planned and cannibalization was established as a primary source for parts when the scheduled delivery of replacement vehicles did not materialize, cannibalization had to be restricted and procurement of spare parts initiated. Adequate stocks of repair

parts had not been received by the end of Fiscal Year 1971. Shortages of engines was the most critical problem.

(U) The liaison visits were considered to be highly beneficial in reviewing the execution of the logistic systems and ascertaining AMC problems at grass-roots level.

Joint Logistics Review Board

(U) The AMC Historical Summary for Fiscal Year 1970 discussed the establishment of the Joint Logistics Review Board (JLRB) and its fact finding operations. During that year, the Logistic Assistance and Readiness Division served as the AMC clearing house for all information requests from and responses to the JLRB. This organization continued to serve as AMC focal point for the JLRB report review phase and for monitoring AMC implementing actions during Fiscal Year 1971.

(U) The JLRB report was completed in July 1970. It was comprised of 21 documents. Volume I contained a summary and major findings. Volume II contained history of logistic support in Vietnam; and Volume III contained summaries of 18 monographs. Separate monograph studies dealt with areas of major concern, such as logistic planning, common supply, communications and transportation. There were 265 separate report recommendations.

(U) The active duty tour of General Frank S. Besson, Chairman of JLRB, was extended through September 1970 so that he could assist in the implementation of the JLRB recommendations. During the period of July through September 1970, while serving as Special Assistant for Logistics in the Office of the Assistant Secretary of Defense, Installations and Logistics (OASD I&L), General Besson distributed the report and

solicited comments from the Armed Services, the Defense Supply Agency, the Joint Chiefs of Staff and interested staff sections in the Office of the Secretary of Defense. Based on these comments, he stratified the 265 JLRB recommendations, took final action on many of them and assigned all of the others for action to an office of primary interest. During this extension, General Besson briefed the Logistics Systems Policy Committee (LSPC) on two occasions and testified before the Military Operations Subcommittee of the House Committee on Government Operations. In that regard, the first recommendation in Representative Holifield's report, based on staff studies and public hearings of the Military Operations Subcommittee, was to "Follow through on the recommendations in the Besson reports."

(U) When General Besson retired, at the end of September 1970, the Director of Supply Management Policy, OASD I&L, was designated as monitor of the JLRB report and the LSPC was given a continuing role in the accomplishment of the report's recommendations. As monitor of the JLRB report, the Director of Supply Management Policy performed necessary follow-up actions and provided periodic status reports to the members of the LSPC. Through these status reports, the LSPC could track progress in implementing JLRB recommendations and identify issues that should be addressed by the committee before a final decision was made on related recommendations. Within the Department of the Army, the Assistant Secretary of the Army, Installations and Logistics ASA (I&L) was designated as the office of primary interest on all Army-related recommendations. Within the DA staff, DCSLOG was designated as the office of primary interest.

(U) At an LSPC meeting on 15 August 1970, the Army was requested to submit a tentative Army position on all 265 recommendations to ASD (I&L). These positions were developed by the DCSLOG staff, reviewed at a general officer meeting of staff elements involved, and submitted to ASA (I&L) on 20 August 1970. Due to limited time provided for the review, DCSLOG was not able to coordinate with AMC, in spite of the reports' heavy impact on AMC operations. Up to that time, a copy of the JLRB report had not been distributed to AMC.

(U) During a briefing to General Ferdinand F. Chesarek, CG, AMC on 25 August 1970, concerning a different subject, he directed that AMC acquire the JLRB report and develop a position on the 265 recommendations. The Director of Logistic Operations (LOG/OPS) was subsequently assigned the task of reviewing the report and developing the AMC position. Accordingly, LOG/OPS prepared the instructions and issued them over the AMC Chief of Staff's signature. These instructions directed that pertinent AMC directors and staff office chiefs designate representatives, to serve on an Ad Hoc Group under the chairmanship of LOG/OPS, to the report review.¹⁴ The Ad Hoc Group was in session from 11 September to 9 October 1970. The final directorate and staff office positions were completed by 16 October 1970. LOG/OPS developed the proposed AMC final position which was forwarded by summary sheet for the Commanding General's approval and signature on 27 October 1970. The Commanding General subsequently passed the package to the Director of Requirements

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Memo, AMCOR-RE, 2 Sep 70, subj: JLRB Recommendations.

and Procurement for revision of the AMC position relative to provisioning of repair parts for construction equipment. This matter was not resolved until 3 December 1970. The position paper was signed by CG, AMC and dispatched to DCSLOG on 7 December 1970.¹⁵ The AMC position on the 265 recommendations of the JLRB was as follows: AMC concurred in 204 of the 265 recommendations. Non-concurred in 6, concurred with qualifications in 8; had no interest in 20; considered 5 recommendations to be duplicated by others; believed that further study was required on 11; the Joint Logistics Materiel Commanders were to give further consideration to 10; and the Command concurred in one part of a two-part recommendation and non-concurred in the second part.

(U) On 30 October 1970, the CG, AMC directed that a detailed plan to implement the JLRB recommendations be developed, and that the plan include specific tasks, definable goals, time phasing, and responsibilities. Accordingly, LOG/OPS issued instructions to pertinent Hq, AMC elements requesting basic implementing plans and monthly progress reports on 26 recommendations, including ammunition, containerization, logistic planning, maintenance, supply management, and transportation and movement control. The initial composite progress report was submitted to the CG, AMC on 3 December 1970.¹⁶ In April 1971, the monthly progress reporting period was changed to a quarterly

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Ltr, AMCOR-RE, 7 Dec 70, subj: JLRB Recommendations.

¹⁶

Memo, AMC-RE, 3 Dec 70, subj: Implementation of JLRB Recommendations.

period.¹⁷ There were 24 recommendations of interest to the AMC outstanding as of 30 June 1971 and 10 of the 24 were being further reviewed by panels of the Joint Logistic Materiel Commanders because of tri-service implications. Of the 265 JLRB recommendation, OSD progress as of 30 June 1971 indicated the following results: duplicates--9; no further action required--110; disapproved for implementation--17; implemented--118; implementation being withheld--10; and no decision--1. A complete set of the final printed JLRB report was provided for the AMC Historical Office.

Materiel Readiness Reporting by ARADCOM

(U) The Army Air Defense Command (ARADCOM) prepared monthly materiel readiness reports, the distribution of which included HQ, AMC and those commodity commands that managed missile equipment utilized by ARADCOM. These reports covered such items as the Hercules and HAWK Missile systems. They also identified the number of failures, repair time for maintenance and supply, modification work orders and critical repair parts failures and their effect on systems readiness.

(U) The Logistic Readiness Division, LOG/OPS; issued revised instructions on 13 May 1971 which required certain commodity commands to¹⁸ analyze reported supply and maintenance deficiencies. AMC distributed these analyses to ARADCOM, CONARC, DCSLOG and to AMC Headquarters. These reports were highly effective in isolating specific problems

¹⁷ DF, AMCOR-LR to HQ, AMC organizational elements, 2 Apr 71, subj: JLRB Recommendations.

¹⁸ AMCR 11-40, subj: AMC Analysis of ARADCOM Materiel Readiness Report.

and bringing about their resolution. The number of ARADCOM Hercules Missile systems was reduced during Fiscal Year 1971 from 76 to 52 because of firing battery deactivations.

DCSLOG Secondary Item Management Review

(U) In 1967 the DA established staff visits, monitored by the Army Comptroller, to review secondary item requirements and budgetary operations at the NICPs. In November 1969, the Chief of Staff decided that DCSLOG should perform the follow-on NICP actions in DCSLOG areas. In October 1970, DCSLOG directed that AMC make a formal NICP review in the area of secondary item management.

(U) This program placed emphasis on review of supply control studies, cataloging, budgets, program accomplishment, and policies and procedures. In accomplishing this mission, HQ, AMC personnel visited six major subordinate commands and the Army Ammunition Procurement Supply Agency in 1970 and 1971.

Other Logistic Assistance and Readiness Activities

(U) Several other phases of the logistics assistance and readiness program should be summarized. These phases included the following programs: the AMC Command Supply Discipline Program; AMC Resources Management; Lessons Learned Program; Command and Control System; Readiness Reporting by Major Commands; the Improved Wholesale Logistics System; Intensive Management of the Armored Reconnaissance Airborne Assault Vehicle (M551 Sheridan); and Expediting Non-Standard Urgent Requirements for Equipment (ENSURE).

19

Ltr, DCSLOG to AMC, 27 Oct 70, subj: Secondary Item Management Review.

(U) The AMC implemented the Command Supply Discipline Program by
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issuing a supplement to the pertinent Army regulation. The DCG for
Logistic Support was designated as the program monitor. The Director
of Operational Readiness (OPRED) (subsequently reorganized as Logistics
Operations), was designated the deputy program monitor. The overall
objective of the program was to achieve maximum use of materiel
resources. The program was divided into two parts. One part pertained
to the retail operations and the second part related to the wholesale
operations. The AMC Comptroller prepared the Fiscal Year 1970 AMC
Annual Command Supply Review, in conjunction with the Director of
Logistics Operations. By mutual agreement, LOG/OPS assumed this
21
responsibility in Fiscal Year 1971.

(U) The Readiness Evaluation Branch coordinated AMC resources manage-
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ment actions for Fiscal Year 1971 actions. This involved review of
major command objectives and five-year programs, preparation of imple-
menting plans, and coordination of the publication of the Logistics
Operations Five Year Program and implementing plan.

(U) The objective of the Lessons Learned Program was to insure that
current and future benefits were gained from experience in AMC logistic
support operations. Prior to 1971, OPRED monitored the Lessons Learned
Program for the entire AMC complex. After that time, each AMC staff

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AMC Suppl. No. 1 to AR 700-87, 22 Jul 70.

21

DF, D/OPRED to AMC Compt., 15 Apr 71, subj: Annual Command
Supply Review.

22

AMCR 11-4, Resources Mgt. System, Vol. I, Aug 70.

element was responsible for action on lessons learned within its functional area. Plans were underway to discontinue the AMC Lessons Learned Program and to reinstate the Logistic Operations Directorate as the focal point for administering the AMC portion of this program.

(U) The Readiness Evaluation Branch coordinated actions on developing²³ the AMC Command and Control System. This Branch developed a work plan for a model study on this system by the Research and Analysis Corporation (RAC). AMETA agreed to furnish assistance in conducting the in-house effort on the study.

(U) Each major Army commander was required to provide copies of his quarterly readiness evaluation to Headquarters, AMC and commodity commands. Commodity commanders were required, in turn, to isolate problems which fell within their commodity management responsibility,²⁴ and to provide feedback for corrective actions. LOG/OPS provided readiness highlight summaries to the AMC Command Group. Improvements in maintaining equipment-on-hand (EOH) levels during Fiscal Year 1971 were attributed primarily to AMC equipment deliveries under special DA equipment readiness policies, which were directed by the Deputy Assistant Secretary of the Army for Installations and Services. Within the AMC headquarters, these programs were administered by the Director of Distribution and Transportation.

23

AR 525-1 Dept. of the Army Command and Control System, 20 Jul 71.

24

AR 220-1, Unit Readiness, 22 Apr 69; Ltr., AMCOR-RE to Commodity Commanders, 18 Aug 69, subj: Logistic Analysis of Major Unit Readiness.

(U) Under the auspices of DCSLOG the Department of the Army conducted a Logistics Offensive Program to re-emphasize logistics principles, update and refine techniques, and more clearly define training and career management objectives. In addition, the Logistics Offensive was geared to support the broad objectives of the Army Chief of Staff known as the four M's--Mission, Motivation, Modernization, and Management. The DCSLOG portion of this program was known as the Improved Wholesale Logistics System. AMC had many actions underway in support of this program. The Logistic Assistance Readiness Division reviewed the program sheets to insure that objectives, significant milestones, target dates, and progress were fully coordinated.

(U) A March 1970 review conducted by the Project Manager of the M551 Sheridan (Armored Reconnaissance Airborne Assault Vehicle), revealed that its operational readiness was below desired standards. Consequently, the CG, AMC directed that monthly readiness reports on the Sheridan be established.²⁵ After initiation of this report, the Director of Logistic Operations vigorously pursued all supply and maintenance problems reported by major commands. After this report was instituted, a fluctuating but generally favorable trend in the readiness of the M551 Sheridan prevailed. It was considered unlikely that this favorable trend would have been achieved without the intensive management effort that was initiated.

(U) The Department of the Army had a noteworthy procedure for expediting non-standard urgent requirements for equipment (ENSURE). ENSURE actions

²⁵

DA Msg. 071933Z, Apr. 70. This was an AMC sponsored message.

were initiated by oversea commanders by a request to ACSFOR for equip-
ment in support of his military operations. ²⁶ OPRED had the AMC
responsibility for the ENSURE Program and for maintaining a register
of ENSURE requirements, including status information. Beginning in
April 1969, the Commanding General, AMC, required a monthly status
report on all outstanding ENSURE requirements. On 1 September, the
Chief of Staff, AMC, directed that ENSURE program functions be trans-
ferred from OPRED to the Deputy Commanding General for Materiel
Acquisition. ²⁷ OPRED compiled the following summary data on the ENSURE
Program for the July - August 1970 period: number of ENSURE projects
completed--10; number of new requests received--1; number of requests
validated by DA--2; number of requests cancelled by DA--6; number of
ENSURE projects on schedule--48; number of ENSURE projects behind
schedule as of 31 August 1970--2; and total validated ENSURE requests--
²⁸
50.

Contingency Support Stocks

(U) The Army Standing Operating Procedure Contingency Support Stocks
provided a means of early initial support of contingency operations
anywhere in the world. War reserve stocks were placed in CONUS depots

²⁶
AMCR 525-2, 7 Feb 68, subj: Expediting Non-standard Urgent
Requirements for Equipment ENSURE.

²⁷
Memo, C of S, AMC to OPRED, 31 Aug 70, subj: Transfer of ENSURE
Program Functions.

²⁸
Monthly Summary ENSURE Status Report for July - August 1970.

29
to support combat consumption for a limited number of days. AMC
revised its operating procedures in accordance with US Strategic Army
30 Forces Structure. Project codes were realigned to provide guidance
31 for computation of requirements by each class of supply. Selection
criteria provided that only mission essential items be selected. Fringe
items were not furnished under the automatic supply system but were to
32 be selected in accordance with current contingency planning concepts.

Logistic Doctrine and Systems

(U) The Logistic Doctrine and Systems (LDS) Division was established
in mid February 1971 within the Directorate of Operational Readiness.
Its primary mission was the supervision and direction of the AMC program
for development and implementation of Army wholesale logistic doctrine
and systems. No such office had previously existed in the AMC. The
chief of this division acted as the AMC representative on the Logistic
Functional Guidance Group, which was a working group of the Army
Logistics Policy Council.

(U) The principal logistics programs for which the LDS division was
the focal point were as follows: Standard Army Logistic Systems;
Standard Army Intermediate Level Supply Subsystem; and the Logistic

29
AMC Standing Operating Procedure (SOP), Contingency Support
Stocks, 30 Jun 67.

30
AMC SOP, Contingency Support Stocks, 30 Nov 70.

31
AR 11-8, Principles, Objectives, and Policies of the Army
Logistics System, Aug 70.

32
DA Cir. 700-18, Logistics Improvement.

Master Plan. The Division's efforts in Fiscal Year 1971 were directed mostly toward staffing and establishing interface with AMC counterparts in such organizations as the Combat Developments Command and the Continental Army Command.

AMC Operations Center

(U) During this fiscal year, the AMC made several important changes in the method of operations in the Operations Center. One change was the transfer of operational control from the Logistics Readiness Division to the Administrative Office. Several Operations Center personnel were reassigned to various divisions in the Logistics Operations Directorate. The Special Assistant for Army Reserve Affairs was appointed Acting Officer-in-Charge of the Operations Center. During this fiscal year, the Operations Center was activated three times. These were in support of: Operations Chase, 10-13 August 1970; Exercise High Heels 71, 24 January - 4 February 1971; and the Washington, DC Demonstrations, 3-6 May 1971.

Summary Statement

(U) Fiscal Year 1971 can be considered as the turning point in the Directorate for Logistic Operations. During the year the degradation of operational readiness was significantly reversed and the authorized strength increased in recognition of the diversified activities with which this Directorate had of necessity to be involved. Further recognition came by the authorization of a civilian deputy director

and the addition of a Colonel as Executive Officer, which the
33
Directorate did not have before this year.

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The position of Deputy Director had been filled by a colonel prior to this year.

CHAPTER VII

MAINTENANCE

Introduction

(U) In accomplishing its mission during Fiscal Year 1971, the Directorate for Maintenance overcame numerous and challenging problems. One of these was the loss of personnel.

(U) The Directorate lost nine individuals, most of whom were higher action officers with many years of experience. Also, as the fiscal year ended, the Director of Maintenance, BG George Young, Jr., prepared to transfer a new assignment. Colonel Eugene J. D'Ambrosio was designated as the new director.

(U) A provisional reorganization took place in the directorate during this fiscal year. The main impact of the reorganization was the establishment on 18 December 1970 of the Initial Materiel Support and Retrograde Office (IMSO); and the transfer of the weapons armament commodity function from the Munitions Armament and Missile System Group to the Vehicle and Equipment Group. Concurrently, the Integrated Logistics Support Division was relieved of the Initial Materiel Support Office mission and functions. IMSO was placed directly under the Director of Maintenance. It served as the focal point for staff supervision of initial provisioning policies and procedures. Another reorganization took place on 2 June 1971 when the Weapons Branch was transferred from the Munitions, Weapons, and Missiles Division to the Vehicles, Equipment and Weapons Division.

(U) Resources to support the mission program were under constant review and revision. However, in spite of shortages, the Directorate managed a depot materiel maintenance and support activities program amounting to \$721,080,500. The execution of this program required the services of approximately 25,700 personnel in the depots, major subordinate commands and AMC special activities.

Initial Materiel Support and Retrograde Office

(U) Since its establishment in December 1970, the Initial Materiel Support and Retrograde Office continued an intensive examination of policies, procedures, and methods in initial provisioning which had begun in 1969. The resultant changes significantly reduced the range and quantities of repair parts initially procured and positioned in the field.

(U) Changes that helped to bring immediate results included the elimination of the use of stockage protection levels which were layered throughout the maintenance and supply system. Also, changed was the policy of requiring all initial provisioning requirements to be computed using anticipated combat consumption rates. (Instead, anticipated peace-time consumption rates were used when provisioning non-combatant oversea theaters). A minimum stockage of two of each item at each maintenance level was no longer required. The policy was changed to the stocking of one or none depending on the essentiality of the end item. Items from the initial stockage list that were estimated to generate less than six demands in a year were also excluded.

Destruction of Biological Warfare Agents and Munitions

(U) In accordance with the Presidential policy in November 1969 and February 1970 on the use of biological and toxin agents and weapons, plans were made by the Army Materiel Command to destroy all stocks of biological warfare materiel. Completed in Fiscal Year 1971, these plans incorporated on site disposal and were predicted on impeccable safety as the foremost guideline. The plans were forwarded for approval to the following interested parties: the Department of the Army; Department of Defense; the Environmental Protection Agency; the Department of Health, Education, and Welfare; the Department of Agriculture; and the Governors of the states in which the demilitarization was to take place. A final step was to file the plans with the President's Council on Environmental Quality, and to notify the Speaker of the House of Representatives and the President of the Senate 30 days in advance of the initial demilitarization.

(U) After the Department of the Army gave approval, the destruction of anti-personnel biological warfare stocks at Pine Bluff Arsenal, Arkansas, was begun in May 1971. Approval was expected in the 1st quarter, Fiscal Year 1972 for the demilitarization of the anti-crop biological warfare agents located at Beale Air Force Base, California; Rocky Mountain Arsenal, Colorado; and Fort Detrick, Maryland.

(U) The time and cost to complete the project by the various installations were as follows:

<u>Installation</u>	<u>Time</u>	<u>Cost</u>
Pine Bluff Arsenal	48 weeks	\$10,830,000
Rocky Mountain Arsenal	52 weeks	3,200,000

<u>Installation (cont'd)</u>	<u>Time</u>	<u>Cost</u>
Beale Air Force Base	12 weeks	254,000
Fort Detrick	26 weeks	750,000

(U) The program of demilitarization of excess and obsolete stocks of lethal chemical warfare agents at Rocky Mountain Arsenal was designated Project Eagle. Originally, quantities of mustard agent, nerve agent (GB), and phosgene were scheduled for disposal at sea in May 1969.¹ However, Congressional action restricted the transportation of lethal chemical and biological agents. Consequently, an Ad Hoc Committee of the National Academy of Science, meeting at the request of the Secretary of Defense, recommended disposal of these chemical agents at Rocky Mountain Arsenal.

(U) Project Eagle was a three-phased operation: Phase I-Mustard Agent; Phase II-Nerve Agent; and Phase III-Phosgene. The detailed plans for each phase was to be approved by the same agencies which approved the plans for the demilitarization of the biological agents. Plans for Phases I and II were completed in Fiscal Year 1971. All three phases were scheduled for completion by January 1974. The total cost of Project Eagle was calculated to be \$25,119,000.

Integrated Logistic Support

Modification Work Order (MWO) Program

(U) Early in Fiscal Year 1971, AMC initiated an intensive management program effort to reduce the backlog of outstanding overage MWO's. The backlog had accumulated over the years and continued to be reported in the Department of the Army MWO Master Index file as unapplied. All

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Section 409, Public Law 91-121; Section 506, Public Law 91-441.

subordinate commodity commands conducted a rigid essentiality review of all outstanding MWO's and rescinded those which failed to meet the criteria.

(U) Major field commands were requested in December 1970 to review listings of delinquent MWO's prepared by AMC. The review (including the one conducted by the commodity commands) resulted in the elimination of 580 MWO's. This effort was to continue into the first Quarter, Fiscal Year 1972. Also, MWO input data was to be printed in support of the SPEEDEX depot MWO program for managing the application of MWO's to serviceable and unserviceable depot stacks.

Publications

(U) Maintainability Engineering Handbook. Due to the rapid progress of the science in the maintainability engineering field, it was necessary to update certain manuals. These documents were used by Army and industry personnel. AMC, in cooperation with the Army Research Office at Duke University, issued a contract to Igor Bayovasky Associates, for the production of the Maintainability Engineering Handbook.

(U) Integrated Logistic Support Guide. The Integrated Logistic Division, Directorate of Maintenance, in cooperation with DCSLOG, revised the Integrated Logistic Support Guide. AMC re-wrote the document and forwarded it to DA. The guide was then sent to the Navy and the Air Force for coordination.

(U) The revision was undertaken when the Deputy Secretary of Defense² ordered on 1 October 1970 the integration of nine of the ten basic

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DODD 4100.35, 1 Oct 70.

areas in logistic support. This action was calculated to begin logistic support requirements simultaneously with the acquisition process of a commodity. Prior to this the logistic support aspect was usually left to a later date. The procrastination often precluded effective planning.

(U) Automation of Reports. A change in AMCR 750-15 reflect new procedures and responsibilities for automatic preparation of the Item Reference Lists and for automating the analysis of the maintenance support planning schedules. The US Army Maintenance Board served as the action agency for the development, testing, and implementation of the procedures for automation. Automation improved the usefulness of the schedules for Headquarters, AMC, Commodity Commands, US Army Maintenance Board, CDC, CONARC, and equipment managers.

(U) The procedures consisted essentially of instructions on programing, key punching, and reproduction of automated output. Basically, the procedures required the commodity commands to key punch ILSP and MSP schedule data on cards, and forward the cards to the USAMC Logistic Data Center (LDC), Lexington-Blue Grass Army Depot. LDC processed the data and reproduced the required number of copies of distribution.

Maintenance Float Computation Progress

(U) The annual review of operational and repair cycle float percentage factors for each approved line item of Army equipment was necessary for the compilation of the fiscal year PEMA budget requirements that were to be submitted to the President's budget. In the past, float factors had been stated by equipment or commodity type rather than by end item. Some items were over-budgeted and some were under-budgeted. Consequently, the final PEMA budget request for maintenance float procurement was at best rough.

(U) In 1969 the Integrated Support Division, Directorate of Maintenance, initiated a program to up-date the basic float factor and the whole maintenance float method of computation. Mainly, this was to be achieved through the rewriting of pertinent Army regulations and technical and supply bulletins. The task of writing the new bulletins was assigned to the US Army Maintenance Board.

Plans and Resources

Uniform Cost Accounting System for Depot Maintenance

(U) In an effort to further standardize depot computation of overhaul costs, on 7 January 1971, the Director of Maintenance directed the formation of an AMC team to conduct an on-site review of 10 major CONUS depots and three major subordinate commands. The team, headed by the Deputy Director of Maintenance, was to determine what changes were needed to improve the maintenance costing procedures. Included in the team were representatives from LSSA, MIDA, F&A, Comptroller, AIF Comptroller, and the Director of Maintenance. Based on the information derived from its investigations, the team drafted a directive for publication throughout AMC that was calculated to achieve standardization. As a result of GAO criticism on a non-standard maintenance costing procedure among the Services, DOD initiated a comprehensive questionnaire to all depot maintenance facilities. It, also, meant to determine what changes in DOD policy and procedures were required to assure standardization among the services. Although the answers to the questionnaire proved helpful, they were not conclusive enough to effect policy changes. In the meantime DA had been pursuing the

the same end.

(U) Alerted of the AMC effort, DA and OSD began looking toward the AMC proposed directive as the base on which to standardize maintenance costing procedures worldwide and among the services. This approach was based and justified on the fact that the AMC-CONUS depot maintenance was the largest program for depot overhaul. On 9 June 1971, the Deputy Comptroller of the Army was briefed on the details of the AMC draft directive. At the time he agreed that the directive should be published and forwarded to all CONUS depots. The Deputy Comptroller of the Army, also, agreed that subsequently the directive should apply worldwide. Accordingly, the Comptroller of the Army, with AMC assistance, was assigned to amend current Army Regulations to reflect provisions of the AMC directive and other changes as required to effect uniform standard maintenance costing procedures, worldwide. This action was assigned a target date of 31 August 1971.

Electronics and Aircraft

Joint Service Studies

(U) It had been observed by the Deputy Secretary of Defense that the maintenance man-hour per flying hour (MM/FH) reporting among the services was not uniform. Consequently, it did not reflect accurately the maintenance performed. To rectify this situation, a joint commanders panel (AMC/NMC/AFLC/AFSC) was established and a study was conducted which resulted in the recommendation of a uniform and accurate system for reporting MM/FH. The Army implemented the system by issuing a DA circular, and by proposing changes to the Army Maintenance

Management System. Other benefits derived from the above study were: a joint service formula for computing MM/FH; ten uniform maintenance data codes (including Equipment Category Codes); and a DODI prescribing uniform cyclic overhaul intervals for each service.

(U) Formerly chartered on 16 June 1970 was another group which created the DOD Engine Requirements, Capabilities and Capacity Study. The study group was formed to provide a basis for evaluating proposed investments in aircraft engine depot maintenance and to seek alternatives to currently projected departmental workload distribution plans. To accomplish the mission each service provided considerable data which was evaluated, analyzed, and compiled for most effective display. The final report, including the summary, findings, conclusions and recommendations was approved on 22 January 1971 by the four commanders and forwarded to the Office of the Secretary of Defense.

Aircraft

(U) In accordance with AR 750-1 the aircraft general support maintenance mission was transferred on 1 July 1971 to CONARC. Previously the mission had been performed in CONUS by AMC aircraft depot maintenance facilities. Being unprogramable due to its uneven workflow, the general support workload became increasingly difficult to accomplish along with depot level industrial type workloads normally programed into depot maintenance facilities. As previously agreed, AMC transferred to CONARC pertinent facilities at Fort Hood, Texas, and Fort Riley, Kansas. Also, included in the agreement were the transfer of personnel, tools, and \$3.2 millions of the Fiscal Year 1972 dollars.

(U) The situation was reversed for Army Aviation. It lacked a helicopter rotor blade repair facility. Consequently, Headquarters, AMC, urged the New Cumberland Army Depot to submit an urgent minor construction request through the Department of the Army to OASD. If approved the facility would be capable of handling in excess of 3000 CA-47 rotor blades each year. It would consist of an 80,000 square foot floor space, and a 300 hp whirl tower for blade testing.

(U) A Headquarters, AMC, letter of 25 February 1970 directed the initiation of a low speed aircraft tire retread program at the Red River Army Depot (RRAD). Qualification tests were successfully completed at the Wright-Patterson Air Force Base. During the Tri-Department Aircraft Tire Coordinating Group meeting held during the period of 18-21 May 1971 at RRAD, Army, Navy, and Air Force Representatives reviewed and approved the RRAD aircraft tire retread facility. Production of Army aircraft retread tires began on 20 July 1971.

Electronics

(U) During the buildup of the US Army and friendly forces in Vietnam in the period of 1965-66, there occurred a severe shortage of certain secondary components/assemblies for communication/electronics end items. The problem was compounded by an inadequate Vietnam logistics structure with a limited repair capability, and the failure to evacuate unserviceables to CONUS for repair. To alleviate the situation, an effective plan was developed between Vietnam and CONUS. The arrangement was for Direct Support/General Support units to air mail critical unserviceable components to specialized CONUS depots which would repair

and return the items to Vietnam usually in less than one week. Although this provided excellent support to Vietnam, it generated a significant amount of paperwork. A new technique, Direct Exchange-Wholesale, was developed to remedy the drawback. It combined the quick turn-around and automated accounting system. Although this had been employed to Corps of Engineers items only, DA directed that it also be applied to other commodities.

(U) In a reversal of the historic doctrine of performing repairs as far forward as possible, the Missile and Electronics Commands concluded that most repairs should be made at rear echelon facilities. This approach reflected the continually growing complexity of electronic devices; the need for sophisticated and specialized test equipment and tools; the greater skills needed to perform repairs; and the increasing trend toward the use of micro-miniature electronic components and assemblies. DA directed that the rear echelon doctrine be applied to other commodities, when possible.

(U) In another electronics project, the automatic digital networks (AUTODIN) were being installed throughout the world to complete the Defense Communications Agency (DCA) communications facilities. AMC provided special maintenance support to the three services by the use of mobile maintenance teams from Tobyhanna Army Depot. Teams of trained depot personnel made calls to theaters on a scheduled basis for on-site magnetic and tape transport maintenance. The lack or delay of this maintenance would cause this complex equipment to deteriorate rapidly and become inoperative. These teams, also, provided emergency on-site maintenance services on the Digital Subscribers

Terminal Equipment which was part of the AUTODIN system. The Air Force and the Navy reimbursed the Army for this service.

Vehicles, Equipment, and Weapons

Tire Retreading

(U) The tire retread program became a matter of command interest in 1968 following a GAO finding, and the Army's desire to effect savings in the new tire requirements.

(U) In 1969 and early 1970, AMC directed its efforts primarily towards Vietnam where 60 percent of the usage was occurring and where limited retread capacity existed. However, by establishing a new plant at Long Binh and taking over the Navy plant at Danang, the retread capacity of Vietnam was increased from 45,000 in Fiscal Year 1970 to 215,000 in Fiscal Year 1971. These plants were government-owned, contract-operated facilities.

(U) The worldwide program was given additional impetus by the Department of the Army in a TAG letter of 5 August 1970.³ In it DA directed that retread tires be used wherever possible to satisfy Army requirements. DA established a goal that would obtain 75 percent of the tire requirements of the Army from retreads. AMC developed a reporting procedure to measure the accomplishment against the DA goal. For the first half of Fiscal Year 1971, 144,278 tires were retreaded for a savings of \$5,304,170. This accomplishment represented 47 percent of the objective.

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AGDA(M) (28 Jul 70) LOG/MED, 5 Aug 70.

(U) Various documents (AR, DODI, and Circular) were prepared and submitted to DA to help formalize the DA policy on tire retreading. Their publication helped to accomplish the goals of the retreading program. However, through the efforts of AMC and TACOM, the following Technical Manuals were published on 15 January 1971: TM9-2610-200-2, Organizational Care, Maintenance, and Repair of Tires; and TM9-2610-200-34, DA and GS maintenance manuals including depot retread of tires.

(U) The modernization of the Tooele Army Depot (TEAD) tire shop was finished in March 1971, and the initial production testing was completed in May of that year. TEAD was to start retreading large, high-dollar tires upon receipt of 7,000 casings from Vietnam. These events coincided with TACOM's recommendation of 19 March 1971 to close the Letterkenny Army Depot tire retreading shop. This action was approved by AMC and DA, and became effective on 15 July 1971.

(U) After two years of study, the tri-Department Committee for aircraft retreading approved on 16 May 1971 the retreading of low speed aircraft tires at Red River Army Depot (RRAD). During this fiscal year RRAD trained approximately 500 students from the Army, Navy, Air Force, and GSA in the inspection and classification of tires, per-award survey of tire facilities, tires and track rebuild, and scientific vulcanization.

Vehicles

(U) In Fiscal Year 1971, four third generation Tempo/UTI PDS-770 sets were purchased. They were evaluated for their effectiveness in automatically diagnosing tactical vehicle engines, thereby reducing unnecessary maintenance. Two sets were sent to TECOM to determine whether the sets could actually do what was claimed. TACOM received a set to

evaluate its design and construction; and RRAD used another to study its capability to improve vehicle overhaul procedures. Completed tests indicated that many shortcomings remained from previous models. Final reports were to be presented to the Steering Committee.

(U) Automatic Checkout System for Combat Vehicle Engines and Transmissions (ACS/CVET). Installations and testing of the ACS/CVET were completed at the Letterkenny Army Depot during this fiscal year. Two test bays became operational for computer-controlled automatic diagnosis of tank engines and transmissions by dynamometer. The ACS/CVET was capable of providing a quality check of the power pack after overhaul or of determining which parts were needed to perform limited overhaul on power packs. In the latter case, indications were that 50 percent of overhaul costs could be saved on approximately 30 percent of the power packs brought in for overhaul. Plans were underway to expand the ACS/CVET to accept power packs from M113A1 series vehicles (6V53 engine).

(U) Maintenance Policy on 1½ Ton Trucks. Because these vehicles were relatively inexpensive to purchase, they were maintained in accordance with TB750-98-23. This publication called for a policy of maintenance at no higher than general service level. In September 1969, DA requested AMC to prepare standards for depot overhaul. The standards for the transmission case were prepared and released to the field. However, standards for the ½ ton and 1½ ton M275 trucks were in the process of completion, and were to become effective 1 September 1971, and 1 January 1972, respectively.

Chaparral/Vulcan Air Defense System.

(U) Red River Army Depot (RRAD) had the overhaul mission for the Chaparral/Vulcan Air Defense System. This item, still not type classified, saw valuable experience in Southeast Asia. Some of the early production models arrived at the overhaul phase in their life cycle during this fiscal year, and RRAD was preparing to provide this capability. Six persons were already trained to handle this workload. Additionally, a pilot overhaul program was reviewed in June 1971, and the finalization of a draft Depot Maintenance Work Requirement was expected in September 1971.

*CHAPTER VIII

DISTRIBUTION AND TRANSPORTATION

Introduction

(U) The challenge from the public and Congress to provide better and more economical logistics support to the US Armed Forces and the free world forces continued from Fiscal Year 1970. That challenge was intensified by the beginning of a retrenchment phase of operations as US participation in Southeast Asia began to decrease. Measurable progress toward this goal became evident in Fiscal Year 1971. This was accomplished by a persistent effort to develop logistic improvements and renovate logistics principles and techniques.

Plans and Control

Readiness Improvement Program

(U) During the fiscal year AMC participated with USAREUR, US Army Alaska, CONARC, USARPAC, and Reserve Components in a DA plan to improve and/or maintain the assigned readiness posture for Equipment on Hand (EOH) of certain selected units.

(U) Based on the intensified management of this program, all combat units of USAREUR maintained their prescribed state of readiness for EOH for Fiscal Year 1971. Despite the revision of authorization of items and quantities during this period, Prepositioned War Reserve stocks (REFORGER, 2 / 10, TR-1 and 4) maintained their prescribed state of readiness for EOH. A total of \$370.5 million was shipped and lifted

*Preparation of this chapter was based on FY 71 Report, Directorate of Distribution and Transportation, HQ AMC, 19 Aug 71.

to USAREUR since the inception of the Readiness Improvement Program, in October 1969.

(U) A target date of 20 June 1971 was set for nine units in the US Army, Alaska improvement program. This target date was met by maintaining visibility of the units' shortages and by expediting forecasted deliveries.

(U) Within CONARC the number of Active Army units selected for participation in the improvement program numbered 99. The target date of 30 June 1971 was established to bring the units up to their prescribed state of readiness for EOH. Materiel valued at \$13.2 million was shipped to 97 units which achieved the aims of the program. Various reasons precluded the remaining two units from achieving the prescribed state of readiness. The MTOE of the 57th Signal Battalion inadvertently included seven lines with quantity restrictions. Consequently, this unit was not scheduled to attain its assigned Authorized Level of Organization posture until 20 July 1971. This was achieved after DA/DCSLOG and DA/ACSFOR authorized the required items. The 47th General Hospital was enjoined by AR 40-61 (Medical Materiel Policies and Procedures) from requisitioning non-medical-type items while in garrison status at Fitzsimons General Hospital, Denver, Colorado. These AMC-source items were required for attaining readiness posture under AR 220-1. The problem was resolved by DA/DCSLOG formally requesting CONARC to direct the requisitioning on non-medical items, and AMC to store these items at the AMC depot closest to Fitzsimons General Hospital.

(U) A target date of 31 December 1971 was established for 134 units of the Eighth US Army to attain their prescribed state of readiness for EOH. However, 130 of these units attained their goal on 20 May 1971. The remaining four units were to reach their state of readiness by 31 December 1971. The latter target date, also, applied to 22 units of the Organized Reserve Corps.

Finance

(U) The Fiscal Year 1972 Command Budget Estimate (CBE) was staff-developed during August 1970. Under Supply Depot Operations (CONUS) the CBE included the provisions for the internal operations of Army depots and arsenals which included receipt, storage, issue, and shipment of assigned stocks. The summary of Fiscal Year 1972 CBE data submitted to the AMC Comptroller was as follows:

<u>Supply Depot Opns</u>	<u>Financial</u>	(Dollars in Hundreds)	
		<u>Unfinanced</u>	<u>Requirements</u>
FY 1971 COB	\$187,224	\$11,435	\$198,659
FY 1971 Mark-up	189,819	4,882	194,701
FY 1972 CBE	159,560	27	187,093

(U) The Supply Depot Operations (CONUS) financed forecast peaked at \$208.3 million in Fiscal Year 1969. Financed forecast for Fiscal Year 1970 was \$203.1 million while it was reduced to \$189.8 million for Fiscal Year 1971. SDOs were funded for 93.9 percent of their actual requirements.

(U) Supply Management Operations (SMOs) had charge of the CONUS National Inventory Control Points (NICPs) and Army Class Manager Agencies. This included cataloging, and overseas inventory control points.

(U) The summary of Fiscal Year 1972 data submitted to the AMC Comptroller was as follows:

<u>Supply Management Opns</u>	<u>Financed</u>	(Dollars in Hundreds)	
		<u>Unfinanced</u>	<u>Requirements</u>
FY 1971 COB	\$122,824	\$6,167	\$128,991
FY 1971 Mark-up	121,979	4,772	126,751
FY 1972 CBE	107,805	14,505	122,310

(U) SMOs (NICPs) financed forecast peaked at \$131.4 million in Fiscal Year 1970, and was reduced to \$121.9 million in Fiscal Year 1971. The SMOs were funded at 100 percent for Fiscal Year 1971.

(U) Second Destination Transportation Services (SDTSs) provided for the movement of troop support cargo within CONUS; operation of the Joint Container Control Office; rental and lease of transportation equipment and services not available on a tariff basis; TDY of pilots; the moving of rail equipment on wheels and the moving of rail equipment on wheels and watercraft by contract tow.

(U) The summary of Fiscal Year 1972 CBE data submitted to the AMC Comptroller was as follows:

<u>Supply Management Opns</u>	<u>Financed</u>	(Dollars in Hundreds)	
		<u>Unfinanced</u>	<u>Requirements</u>
FY 1971 COB	\$122,824	\$6,167	\$128,991
FY 1971 Mark-up	121,979	4,772	126,751
FY 1972 CBE	107,805	14,505	122,310

(U) SDTSs financed forecast peaked at \$72.0 million in Fiscal Year 1969. It was reduced to \$70.7 million in Fiscal Year 1970 and further reduced in Fiscal Year 1971 to \$58.1 million. The SDTSs were funded at 100 percent for Fiscal Year 1971.

(U) Maroun System Requirements. In June 1970, the Chief of Staff, US Army, requested the Comptroller of the Army (COA) to review and report any variances that existed in the level of Operation and Maintenance Army (OMA) base operations support among CONARC installations; to isolate causes for the variances; and to make appropriate recommendations. COA established a group under the direction of Major General Maroun to perform this task. The objective of the study was to develop a method for validating and updating DA cost factors for CONARC base operations. This was to be accomplished by using detailed installation cost factors in order to determine funding levels in consonance with mission workload. On 25 March 1971 the Chief of Staff approved the findings of the study group. He further directed that the analysis be continued and extended worldwide to both mission and base operations OMA costs. As a result, the Department of the Army requested AMC Headquarters to prepare and submit specific data in the Army-wide study and analysis of OMA, and to establish a system which would provide for an annual updating.

(U) The purpose of this program was to prove by selection and manipulation of base data in a mathematical model that the size, composition and stationing of the active Army dictated the amount of appropriated OMA funds required to individually operate and maintain CONUS Class I installations, CONUS Army Headquarters, and CONARC Headquarters. Four target dates were established for the completion of principal milestones. These dates included 1 July 1971 for dispatching a directive

to USAMC field elements; 16 August 1971 for the field units to complete their input to USAMC; 8 December 1971 for the initial USAMC report to DA; and 31 December 1971 for the dissolution of the Maroun Study Group. No date was established for the implementation of the Maroun System.

Systems and Reports

(U) Military Supply and Transportation Evaluation Procedures (MILSTEP) became effective 1 July 1970. This was the DA implementation of DOD-MILSTEP. It was designed to produce uniform Defense-wide logistics performance measurement reports which would be used in achieving UMMIPS (Uniform Materiel Movement and Issue Priority System) objectives. Pertinent MILSTEP reports on requisitioning, receipts and issues to the Directorate of Distribution and Transportation, AMC, included: Format 1A-Pipeline Performance Analysis Report; Format 1A-Diagnostic Report with Summary of Lines Shipped; Format 1B-Pipeline Performance Analysis Report; Format 2-Supply Availability and Workload Analysis Report; Format 3-Response Rate Report; and related analysis. Changes and revisions, based on the General Functional System Requirement concept, to the MILSTEP system were to be implemented after the Alpha/SPEEDEX (AMC Logistics Program--Hardcore Automated/System-wide Project for Electronic Equipment at Depots-Extended) impact was determined.

(U) Management Indicators. MILSTEP reports along with AMC Financial Management reports, AMC Command Objectives, Logistics Performance and

Management Evaluation System analyses, and the Command Supply Discipline Program were used as management indicators. They provided the Director of Distribution and Transportation a ready reference summary of performance by AMC activities, including those of the National Inventory Control Points and the AMC depots. Each performance indicator was used as a quantitative measure of performance which provided the best perspective of the total management effort applied in a given area.

(U) SPEED-SPEEDEX (System-Wide Project for Electronic Equipment at Depot-Extended) Program. The SPEEDEX prototype operation began on 28 July 1970 at the USAMC Logistic Systems Support Agency, Letterkenny Army Depot. Its initial running time was too long. While certain problems were being solved, the DA Project team recommended on 12 February 1971 the extension of SPEEDEX to other depots. SPEED programs were operating at 11 Army depots.

(U) SPEEDEX specifications called for real time processing of high priority Materiel Release Orders (MROs). This was based on the current UMMIPS depot processing standards for the Issue Priority Group (IPG) - one MRO of 16 hours, as was prescribed by AR 725-50. Current MILSTEP time frames allowed one day rather than 16 hours for IPG-1 depot storage processing because MILSTEP could not measure processing in terms of hours. The DOD UMMIPS directive, also, prescribed one day for IPG-1 depot processing.

(U) Experience showed that three cycles per day were normally required at major depots to meet the one day IPG-1 standard. Letterkenny Army Depot ran four MRO cycles per day - three high priority and one low

priority cycle. While the SPEEDEX specifications were considered stringent, the SPEEDEX programing feature previously described did not permit the depot commander to reduce the number of cycles actually run to the lowest number required to satisfy his performance requirements.

(U) Problems were coordinated daily between SPEEDEX and depot personnel, and quick corrective action was taken. The Control Data Corporation (CDC), the general contractor for SPEEDEX, made the following proposals to solve these problems: install additional CDC 3300 configurations; provide additional CDC personnel on site; increase and improve quality of spare part support; and improve coordination between CDC, the Office of the Deputy Commanding General for Logistics Support, and Office of Management Information. The implementation of SPEEDEX CONUS-wide required reprograming at ALMSA and at non-ALPHA (USAMC Logistics Program-Hardware Automated System) activities.

Stock Management

Direct Supply Support Test

(U) The Direct Supply Support (DSS) Test to Europe was initiated on 1 July 1970. Its purpose was to support Supply Support Activities as far forward as was possible from a Theater Oriented Depot Complex in CONUS. This was accomplished by using SEAVAN containers and 463L Air Pallets, thus by-passing the overseas depots and bulk-break points. By utilizing modern methods of communication such as container ships, and heavy lift aircraft, the order and shipping time could be reduced; visibility could be established over the total supply and transportation

system; and overseas depot requirements objectives could be reduced to safety levels or War Reserves, as applicable.

(U) Initially, the direct support units of the 3d Infantry Division and the 4th Armored Division (replaced on 10 May 1971 by the 1st Armored Division) were supplied with Class IX items through this system. During the period of 1 February to 1 April 1971, 27 additional units of the VII Corps were added to the test. These latter units included missile and aviation direct support units and four supply and service battalions handling Class II and IV items. Four more units were added in June and July 1971.

(U) Direct Supply Support for Korea started on 15 February 1971 with seven nondivision SSAs which included aviation and missile support activities. Sixteen more units, including the divisional DSU were scheduled to be added during the period of 1 July 1971 to 1 September 1971.

(U) The visibility provided by DSS revealed many problem areas in the supply and transportation system. Initially, the authorized stockage lists (ASL) contained items which were not demand supported. The supply systems coordinators purified these ASLs and the demand criteria was strictly applied. On 7 April 1971 the resultant turbulence in ASLs caused DCSLOG to freeze for six months the ASLs of the 3d Infantry Division and the 4th Armored Division direct support units. If this proved successful, ASLs of all DSS units were frozen and items carefully screened before they were added or deleted in the SSAs.

(U) The in-country processing segment of the order and shipping time proved to be lengthy when measured against the DSS standard. Procedural

changes in the inventory control centers greatly improved in this area, although the problem had not been resolved completely.

(U) The original standard of 35 days for order shipping time proved to be too short. Consequently, the in-process review in February set new standards of 45 days for ASL requisitions and 51 days for non-stockage list items. These changes were made in the light of experience over the first seven months of the test.

(U) Another problem was the high rate of back orders at the national inventory control point level. In an effort to improve the situation, the DCG AMC directed on 18 March 1971 that all available funds at NICPs be spent first on DSS ASL items. Second priority would be given to expenditures on other theater authorized stockage list items. However, the six month lead time on procurement actions meant that no improvement could be expected before October 1971. Finally on 22 June 1971, the CG, AMC announced a policy of establishing 100 percent as the immediate objective rate of initial fill for DSS ASL requisitions.

(U) Furthermore, the DSS test revealed a need to identify substitute shipments for the user and to link that substitute federal stock number (FSN) with the FSN originally requisitioned. A proposal was being considered to permit the inclusion of the FSN of the original item requisitioned in the substitute data field of the Single Line Item Release/Receipt Document.

(U) The high percentage of DSS requisition rejects (10 percent) at NICPs indicated that there was a lack of agreement in catalog data between NICPs, MATCOM (Europe), and SSAs. This was corrected by a

program for assuring that NICPs, AMC Cataloging Data Office, and MATCOM (Europe) catalog data were in complete agreement.

(U) An in-process review of DSS in Europe for the first 10 months revealed marked accomplishments. It showed that order and ship time, from the day of the SSA requisitions to the day receipt was entered in the SSA account, were reduced from 135 days to 57 days. For the first time AMC had timely visibility over the entire supply and transportation system. This made it possible to analyze segment by segment and take remedial action when deficiencies were identified. Because of the DSS test, item managers in NICPs had visibility over the true consumption at user level.

(U) In May 1971 DSS introduced an automated monthly reconciliation of SSA/MATCOM/NICP/LIF (Logistic Intelligence File) open requisition records. Manual reconciliations had been accomplished in January and March 1971. This reconciliation insured that dues in and dues out records were current and relevant to the needs of customers at all levels.

(U) During the 10-month test, stop-off procedures were introduced. This enabled SEAVANs sequentially loaded within up to three consignees cargo to be lifted and shipped direct to customers, thus by-passing bulk break points. Also, DSS reduced documentation discrepancies and misdirected shipments.

Storage and Transportation

Special Assignment Airlift Missions (SAAM's)

(U) A continuing requirement existed during Fiscal Year 1971 to expedite lift of critical cargo to Vietnam and other vital areas. Aircraft of the Military Airlift Command (MAC) was used extensively to lift urgently required materiel. As shown below there was an overall increase of 1.8 percent over Fiscal Year 1970 in the use of SAAM's:

<u>Fiscal Year</u>	<u>Southeast Asia (Short Tons)</u>	<u>Other than SEA (Short Tons)</u>	<u>Total Worldwide (Short Tons)</u>
1970	8,630	2,603	11,241
1971	9,113	2,326	11,439

(U) The tonnage to Southeast Asia (SEA) by SAAM consisted mainly of 1,595 helicopters and 8,428 aircraft engines. To maintain the required operational readiness posture, attrition or damaged aircraft were retrograded to CONUS on returning SAAM flights. These damaged aircraft were repaired and returned to RVN. This retrograde action brought SAAM costs in line with MAC air channel costs to justify the use of special aircraft.

(U) The C-5 Galaxy aircraft was introduced into the MAC fleet during this year. Its capability to lift up to 75 short tons of cargo meant that a significant increase in the number of helicopters could be lifted at one time. Where the C-133B aircraft lifted one CH-47 helicopter, the C-5 aircraft lifted three. Twelve UH-1H/AH-1G were lifted in a C-5 aircraft in lieu of three for the C-141 aircraft. The C-5 could lift one M48A3 Tank (50 short tons) or three M41A3 Tanks (70 short tons).

MAC Channel Airlift

(U) Total MAC Channel Army sponsored airlift decreased in Fiscal Year 1971 by approximately 26 percent below the Fiscal Year 1970 level. Southeast Asia airlift dropped 32 percent, while the Vietnam airlift indicated a decrease of 38 percent. The Fiscal Year 1971 decrease in airlift was attributable to the withdrawal of troops from the Pacific area; and the AMC challenging program to divert shipment from airlift to surface transportation.

(U) The cost-cutting theme was, also, carried out through the DA control of premium transportation. Premium transportation was considered the usual method for cargo bearing TP-1 and TP1-2 priority codes. The validation of airlift requirements with the requisitioner included shipments weighing 500 pounds or more. In March 1971 DCSLOG directed that the 500 pound limitation replace the 1,000 pound limitation. The success of the AMC validation program was shown by the large Fiscal Year 1971 cost avoidance which totaled \$107,125,397.

Denials

(U) The materiel release denial rate for Army materiel release orders to AMC depots was the best in the history of AMC. It went from the denial rate of 4.0 in Fiscal Year 1966 to 2.2 in Fiscal Year 1971. The DA goal of 2.5 was met. Plans were developed for a zero balance flasher system to notify inventory control points when the depot reached zero balance.

Change of Status of Certain AMC Activities

(U) Close out of the storage and supply mission of Granite City Army Depot was finalized on 14 June 1971. The Rio Vista Storage Activity,

Rio Vista, California, Navajo Army Depot, and Fort Wingate Army Depot were placed in reserve status. The latter two installations were designated as Depot Activities under the Commanding Officer, Pueblo Army Depot. The activities were to be filled to capacity with ammunition items suitable for long term storage.

Storage Modernization

(U) Considerable progress was made in the AMC Depot Modernization Program in Fiscal Year 1971. Contracts totaling \$3 million were awarded for installation of an Automatic Storage and Retrieval System (ASRS) in support of maintenance at Letterkenny Depot; and an ASRS and power and feed conveyor system for general supply at New Cumberland. The installation of major materiel handling systems progressed as scheduled. An ASRS in support of maintenance was completed at ARADMAC; and power and feed conveyor systems for supply operations were completed at Anniston, Red River, and Tooele Depots. Capital equipment such as low level stock selector tracks, specialized fork lifts, and adjustable storage racks continued to be procured, as funds became available. These factors increased efficiency and reduced time response, and were expected to eventually result in cost savings by reductions in personnel spaces.

Troop Support

Army Class Manager Activities

(U) Over an extensive period of time, AMC conducted several in-depth studies of the functions, organization, locations and methods of operations of the Army Class Manager Activity (ACMAs). These studies ranged in concept from minor changes in functional assignments and

scope of operations to partial and complete major consolidation at various locations. On 8 October 1970, the Commanding General, AMC, approved several recommendations proposed in these studies.

(U) Effective 31 July 1971, all ACMAs were provided centralized ADP support from the New Cumberland Depot Data Processing Directorate. Also, the US Army General Materiel and Parts Center (USAGMPC)² was formed at New Cumberland Depot by consolidating General Supplies (Richmond, Virginia), Industrial Supplies (Frankford Arsenal, Pennsylvania), and Construction and Ground Support Materiel (US Mobility Equipment Command, St. Louis, Missouri). The cataloging functions for the aforementioned three commodities, plus electronics items, totaling about 750,000 line items, were transferred from ACMA responsibility to the AMC Catalog Data Office, New Cumberland Depot. This enabled a single catalog data management file to support all ACMAs.

(U) The Subsistence ACMA at US Army Area Support Command, Chicago, was relocated to US Army Support Center, Philadelphia, and merged with the Clothing and Textile ACMA. The ACMA at ECOM (Philadelphia) remained in place.

Managerial Responsibilities for BOQ Items

(U) Budgeting and programing for Bachelor Officer Quarters initial issue furniture requirements was the responsibility of AMC. The concept of central control of procurement and inventory of initial issue and replenishment of furniture and furnishing requirements for all Government Controlled Non-Housekeeping Personnel Quarters and family

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AMC GO No. 90, dated 3 May 1971.

housing in CONUS and overseas was established by DODI 4165.43, dated 7 August 1970. This directive also specified that each DOD component was to establish a Furnishings Management Office (FMO). These units were to be at three levels: headquarters, command, and installation levels. They were to manage family and bachelor housing furnishings.

(U) The FMO at Headquarters coordinated procurement and distribution actions; approved each major procurement; redistributed outside an installation in CONUS, and outside a command overseas; and established liaison with DOD components.

Logistics Systems

Selected Item Management System (SIMS)

(U) The SIMS program was designed in response to instructions from the Department of Defense.³ They required the National Inventory Control Points (NICP) to extend their asset knowledge and control over selected items. Implementation of SIMS was begun on 1 July 1970.

(U) SIMS provided item visibility to the NICP through receipts of monthly Availability Balance Files and Demand/Return History Files (DHF/RHF) from all overseas commands and from automated CONUS Class I and Class II installations. In addition, quarterly asset and demand data was furnished from automated overseas Direct Support Units and General Support Units. This asset data was to be used by the NICP in the determination of requirements in the Army Materiel Plan and in the supply control studies. Increased asset visibility would permit the

NICP to attain reduced requirements objectives; reduced pipeline and inventory costs; balanced worldwide stock position; reduced zero balances; and utilization of worldwide assets for priority application.

(U) Secondary items selected for intensive management met the following criteria: items approximating 80 percent of the annual procurement; all items with a gross annual demand of \$500,000; closed loop support items; and other items selected by the NICP as essential and critical.

(U) SIMS covered 4,620 items representing approximately 60 percent of the annual dollar demand requirements. However, in accordance with DA direction of October 1970, the SIMS item list was expanded, effective 1 February 1971, to 7,203 items. The criteria for item selection were: all PEMA secondary items with an annual dollar demand of \$10,000 or more; all stock fund items with an annual dollar demand of \$50,000 or more; items approximating 80 percent of the annual procurement program for secondary items; and closed loop support items. The 7,203 items permitted intensive management of secondary items representing about 80 percent of the Fiscal Year 1971 budget for Stock Fund sales and PEMA item issues.

(U) In obtaining and utilizing worldwide asset visibility data, it was recognized that extensive ADP support would be required, based on an integrated plan of specific standard ADP support details. In order to realize maximum benefits, full automation of SIMS, utilizing the ABF and DHF, was to be pursued. Prior to initiation of actions which were to commit ADP resources, it was necessary to obtain assurance that the time frame for operation would warrant utilization of the required ADP resources. Accordingly, Headquarters, AMC, with tacit approval of

DA, established the policy that the SIMS/ABF program for obtaining and utilizing worldwide asset visibility data would be employed through Fiscal Year 1975. Actions were then initiated to automate the SIMS/ABF procedures.

(U) Because of the differences in file structures at all reporting commands three data reduction centers were established in CONUS. They were to convert all input data into standard ABF and DHF/RHF formats.

Deactivation of Logistics Management Offices

(U) The Logistics Management Offices (LMOs) were established in May 1968 to assist in the conduct of the OASIS test program. LMOs were established in USAEUR and the USARPAC sub-commands (Hawaii, Japan, Korea and Okinawa). Due to a reduction of mission assignments LMO Japan was inactivated in June 1970.

(U) Though OASIS was phased out on 30 June 1970, the remaining LMOs were retained to assist in the implementation and operation of the SIMS program. By January 1971 the functions and responsibilities of the LMOs in the SIMS program had decreased. However, there remained a continuing requirement for USAMC supply management personnel in oversea areas. Consequently, as the LMOs were inactivated in April 1971, the personnel was transferred to the US Army Logistics Assistance Office.

C-5 Evaluation Office

(U) The AMC C-5 Evaluation Office was activated in January 1971 as an AMC Project Manager Office with Colonel R. A. Littlestone as chief. This new office was placed under the Director for Distribution and

Transportation to develop and execute the Army Logistics portion of the joint Army/Air Force Category III C-5 Aircraft Test and Evaluation.

(U) In July 1969 the DA Chief of Staff established staff responsibilities for use of the C-5/Heavy Lift Aircraft capability in the combat service support role. The primary responsibility was assigned to DCSLOG which in turn designated the Combat Developments Command (CDC) as the user-representative for the preparation of plans, and conduct the Army portion of the C-5 user tests and field evaluations. Major Army commands were directed to participate as required to develop and coordinate with CDC detailed plans to support the evaluation program. In September 1970, AMC was tasked with preparing the necessary implementing plan to evaluate Objective 1 of the joint Army/Air Force Category III C-5 Aircraft Operational Test and Evaluation. This was "to determine the characteristics, capabilities and limitations of the C-5 aircraft in the air logistics role and its relationship to Army Logistics systems."

(U) The responsibility of the C-5 Evaluation Office included the determination of key questions, developing and publishing the AMC portion of the C-5 Evaluation Plan, data collection form preparation, data collector training; data collection, evaluation of all segments of the air logistics system, and writing the final report for submission to CDC.

(U) The C-5 Evaluation Plan sought to accomplish the following:

- (1) Determine the ability of depots and small shipment consolidation points to configure utilized loads for air movement.

(2) Determine the suitability and adequacy of designated APOE/APODs, to include situations of saturation, and requirements for any additional ports or other facilities.

(3) Determine the capability of the channel Aircraft System to move to overseas areas those items designated to be routinely moved by air and those requiring emergency air movement.

(4) Determine the capability of the C-5 aircraft to transport intensively managed items, reparables and outsized cargo designated to retrograde to CONUS.

(5) Determine the adequacy of the terminal clearance capability of the intra-theater transportation system.

(6) Evaluate the airlift portion of the USAMC Direct Support Supply Tests to Europe and Korea.

(7) Determine whether the increase in MAC channel traffic permitted a significant reduction in Army items in the pipeline and/or stocked in the overseas theater.

(8) Identify and develop training requirements and planning factors applicable to the Army when supported by the C-5.

(9) Determine the adequacy and workability of current joint and Army doctrinal and applicatory literature; and identify the requirement for new and revised doctrine for the employment of the C-5 in the logistics role.

*CHAPTER IX
INTERNATIONAL LOGISTICS

Administration and Organization

Directors

(U) Brigadier General Arthur W. Kogstad became Director of International Logistics on 15 July 1970.¹ General Kogstad succeeded Colonel Michael Gussie,² who served as Acting Director from 13 March to 15 July 1970. The mission of the Directorate of International Logistics concerned the policies, program goals and objectives for all international logistics programs.

Transfer of Functions

(U) On 1 July 1970 the US Army Japan Military Assistance Program (MAP)/ Agency for International Development (AID) function was transferred from the US Army Pacific (USARPAC) to the International Logistics Center/ Logistics Control Office-Atlantic.³ On 2 November 1970, Project OUX functions and one personnel space were transferred from the Directorate of Distribution and Transportation to the Directorate of International Logistics. These functions involved the intensive management of items considered critical to the Vietnamization Program. The International Logistics Directorate was responsible for monitoring the movement of these items to meet the Joint Chiefs of Staff time-phased requirements.

¹ AMC Special Order 122, 8 Jul 70.

² AMC Special Order 44, 13 Mar 70.

³ Ltr, LOG-MAGAD 9684, 3 Oct 69, subj: Phase Out of USARJ MAP/AID Mission.

* Preparation of this chapter was based on AMC Directorate of Int'l Logistics Historical Summary, FY 71.

(U) On 11 January 1971 the remaining operational responsibilities and related files of the Headquarters, AMC in support of the Agency for International Development Programs were delegated to the US Army International Logistics Center (ILC) at New Cumberland, Pennsylvania.⁴ The ILC received requests for price, availability, procurement orders and requisitions directly from the Agency for International Development, and was the single CONUS activity to receive funded AID materiel requirements for supply from the Department of the Army. The ILC was required to submit status reports reflecting total dollar value of programs and deliveries by country.

(U) In February 1971, the ILC received authority to process claims against a special \$25,000 Army Stock Fund authorization for Fiscal Year 1971, involving Foreign Military Sales discrepancy reports and case close-outs. Responsibility for resolving problems in connection with claims remained with Headquarters, AMC. The Logistics Control Office-Atlantic, which was relocated from the Brooklyn Army Terminal to the ILC on 25 June 1970, was established as a separate class II activity of the AMC on 19 February 1971.⁵

(U) As a result of force structure reductions, supply support arrangements for support of Germany, Belgium, Netherlands and Italy from Materiel Command, Europe (MATCOMEUR) were to be curtailed or eliminated. Currently, the AMC was developing plans for the transition of support

⁴ Ltr, Dir. of International Logistics, HQ, AMC to ILC, 11 Jan 71, subj: Transfer of AMCIL Functional/Managerial Responsibilities in Support of AID to ILC.

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(1) AMC GO 163, 7 Jul 70. (2) AMC GO 56, 19 Mar 71.

for the above nations from the Materiel Command, Europe to CONUS.

Support of Canadian Forces from MATCOMEUR remained unchanged.

Management Improvement

(U) Beginning in May 1970, a study group from the Directorate of International Logistics examined in depth the management of international logistics functions in the AMC. The group studied the command's interface with the Department of the Army in order to determine whether the existing system was satisfactory or whether it should be modified. The study approved by the CG, AMC outlined the objectives of the management improvements planned.⁶ The plan for a centralized integrated system for international logistics was completed in December 1970 and forwarded to the AMC Automated Logistics Management Systems Agency (ALMSA), in St. Louis, Missouri, which was to initiate the detailed functional system requirements. By the end of this fiscal year, the plan had progressed to the point of identifying the residual functions at the major subordinate commands and establishing time frame for realignment of personnel and a schedule for implementing the centralized integrated system for international logistics.

(U) The AMC Director of International Logistics recommended to the DCSLOG Director that the quarterly review of the program by the Department of the Army be presented semiannually rather than on a quarterly basis. The adoption of this idea on a trial basis saved approximately 1000 manhours and time and travel costs for 21 people. Between formal

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AMCIL Briefing to CG, AMC, 22 Jul 70.

reviews, AMC kept DCSLOG informed on supply performance of international logistic programs by reports prepared by national inventory control points, telephone communications, and informal visits. Additional savings were expected to be derived from changing the Defense Supply Agency (DSA) and General Services Administration (GSA) international logistics reviews from a quarterly to a semiannual basis.⁷

(U) The AMC Director of International Logistics developed the first International Logistics Summary Brochure in the first quarter of Fiscal Year 1971. This brochure was to be updated quarterly to keep the Director of International Logistics, DCSLOG, Commanding General, AMC, commodity commands, and interested directors abreast of overall international logistics performance.

Co-Production Projects

(U)Lt Col Arthur L. Goodall completed his tour as Chief of the Co-Production Management Office on 19 July 1970 and was replaced by Lt Col Baird P. Bryson in September. When Colonel Bryson was shifted to the Military Sales Division on 1 November 1970, Col Stephen J. Pagano became chief of the Co-Production Management Office. This office had been responsible for managing the US portion of the M113 Armored Personnel Carrier (APC) Co-Production Program since its inception. Italy completed the first 3,000 vehicles late in Fiscal Year 1970.

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Ltr, LOG-ACD 8221, to DCSLOG, 22 Sep 70, subj: Intl. Log. Quarterly Review.

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Management responsibility for further production of these vehicles was transferred to Commanding General, Tank-Automotive Command in Detroit, Michigan, effective 1 January 1971.

(U) The Italian Government and its co-producing industry, OTO Melara, signed a contract in May 1971 for the first 120 of the follow-on production of 600 M113A1 diesel armored personnel carriers. The Allison Division of General Motors Corporation was authorized to use US Government-owned tooling on a rent free basis to manufacture 600 TX-100⁸ transmissions ordered by Italian industry for these M113A1 carriers.

(C) Italy was to produce 400 M548 cargo carriers after completion of the M113A1 production. Since this cargo carrier was one of the M113 APC family, the AMC obtained Office, Secretary of Defense agreement for co-production of this vehicle under the existing Memorandum of Understanding between the US and Italy. All provisions of this memorandum were to apply to the M548 carriers except the computation⁹ of required expenditure by Italy in the US.

(U) The T130 Track for the M113 APC, as produced in Italy, lasted significantly longer than US-produced track. Therefore, in Fiscal Year 1968 the AMC began a product improvement program. In tests at Yuma Proving Ground and Aberdeen Proving Ground, two vehicles each completed 6000 miles with satisfactory results. However, these tests revealed that improvement in the rubber bushing was needed. The Tank-Automotive Command

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Ltr, TACOM (AMSTA) to CG, AMC, 5 Mar 71, subj: M113A1 Personnel Carrier - Co-Production with Italy, with Incl.

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Ltr, DA to Col Salvatore Pontieri, Military Attache, Italian Embassy, 16 Mar 71.

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initiated laboratory tests on a bushing which used a rubber compound with the characteristics required to match the life of the track shoe. Sample bushings from four commercial sources were undergoing final tests at the end of the Fiscal Year 1971.

(U) During this year, the US Army Procurement Center in Frankfurt, Germany, signed a contract with the Italian producer MONTEDEL for 61 GRC 106 radio and installation kits. These were the last items to be produced by Italy, for shipment to Turkey as US Grant Aid, in exchange for one Hawk battalion of equipment. All other Hawk-Barter items had been shipped.

(C) Italy desired to co-produce an additional 108 of the M109 SP Howitzers. These vehicles were no longer available from US industry, and Italy asked for assistance in obtaining them. Because of high production start-up costs, an attempt was made to locate vehicles among US assets. All available M109s were needed for US requirements and commitments, so in-country vehicle production was recommended as the most feasible approach. Italy later decided against co-production of these vehicles.

(C) During this fiscal year there were several other co-production proposals. The AMC received a Department of Army draft memoranda of understanding for co-production of Hawk and Nike Hercules missile systems with Japan. DA requested recommendations on a proposed revision of the Hawk Limited Improvement Program Agreement of July 1968. AMC forwarded its recommendations to the DA. The Republic of China

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Ltr, AMC to Col Salvatore Pontieri, Italian Embassy, 9 Mar 71.

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proposed co-production of an additional quantity of UH-1H helicopters, which would extend the project through Fiscal Year 1975. Planning was underway for negotiations with the Republic of Korea to meet that country's M16A1 rifle ammunition requirements. Also, a study was begun on the feasibility of a Korean tactical vehicle co-production/assembly program. Also, AMC had provided technical assistance to the Army in support of the Tow Missile System co-production with several NATO countries.

(C) At the request of the Department of Army, the AMC developed and furnished a list of defense items considered most promising for cooperative effort with European allies. The Department of the Army also requested a review of existing policies and procedures to ensure appropriate emphasis on cooperative armament agreements. AMC advised the DA of steps taken to emphasize these arrangements and of the efforts being made to determine those items most suitable for co-
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production and related sales.

(U) During his visit to Norway in Fiscal Year 1971, the AMC Director of International Logistics received a briefing on the Norwegian 20mm Multipurpose M/70 Round of Ammunition. The Chief of Staff of the Norwegian Army Materiel Command proposed that offset advantages be studied to determine if benefits justified additional costs. The AMC sent a comprehensive questionnaire through the MAAG's to six foreign

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(1) Ltr, AMC to DA, 2 Nov 70, subj: Cooperative Armament Arrangements-Foreign Military Sales and Co-production. (2) Ltr, AMC to DA, 7 May 71, subj: Cooperative Armament Arrangements-Foreign Military Sales and Co-production.

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countries engaged in the co-production program. After receiving the replies to this questionnaire, the AMC undertook the work of completing this study.

(U) While on active duty with the US Army in May 1972, Major Raymond E. Parcell, Jr., conducted a management review of the M109 SP Howitzer Co-Production Project with Italy, Netherlands and Norway. This review covered project operations from inception. The report was used as a co-production project management guide.

(U) The AMC Directorate of International Logistics coordinated and monitored seventeen co-production projects covered by agreements with six foreign nations and NATO. This involved five commodity commands and sixteen different defense items. On 30 June 1971, the AMC Co-Production Program had a foreign country value of \$1.5 billion, of which \$575.5 million was to be spent in the US during the period covered by the agreements.

Secondary Item Support

(U) The Secondary Items Support Office was responsible for managing supply support arrangements with friendly foreign governments, and staff coordination for intensive management of all International Logistics Program secondary items and repair parts. The Supply Support Arrangement program grew from one country (Germany) in 1962 with a value of \$13.3 million, to seventeen countries and one international organization during FY 1971 with a total value of approximately \$175 million. Sales during FY 1971 were approximately \$40 million.

(U) The most significant events and actions in this program during Fiscal Year 1971 were as follows: Supply support arrangements with the Australian Army, Air Force and Navy were renegotiated and continued in effect during Fiscal Year 1971. The current dollar value of the Foreign Military Sales Orders (FMSOs) in effect with Australia was \$7.5 million. The US Army negotiated a supply support arrangement with the Australian Ministry of Defense during June 1971. The value of the FMSOs then in effect with Austria was \$2.7 million. The supply support arrangement program continued with Canada during Fiscal Year 1971 with a dollar value of \$12.2 million. The US renegotiated supply support arrangement with the Republic of China Armed Forces in May 1971. This program was valued at approximately \$10.4 million, which represented an increase of \$2.7 million over the prior year. In January 1971, the US renegotiated the Danish Army CY 1971 FMSOs. The program then covered support of six major end items with a total value of \$3.5 million. Rapid escalation of the program's value indicated that Denmark intended to rely on the supply support arrangement program for follow-on support of most US designed/produced equipment. The program value by year was as follows: December 1969-- \$.035 million; June 1970--\$1.2 million; and January 1971--\$3.5 million.

(U) The Supply Support Arrangement Program with Germany had expanded each year after its inception in 1962. The program total dollar value during Fiscal Year 1971 remained at approximately \$120 million. Beginning in late 1970, the US and Germany held supply support conferences semiannually. They were held alternately in Germany and the US. By letter dated 8 December 1970, the Director of International Logistics,

Department of the Army, assigned the AMC responsibility for future supply support conferences. The US representatives included members from CINCEUR, MATCOMEUR, MAAG (Germany), and AMC Headquarters and subordinate commands as appropriate. The German representatives were from the Federal Ministry of Defense, Army, Air Force, and Navy General Staff. The US and Germany held two conferences in Fiscal Year 1971. The Department of the Army hosted a conference at the Army Missile Command on 16-17 November 1970. The German Air Force was host at the conference held in Munich, Germany, in May 1971. Several presentations and discussions resulted in mutual agreements for resolution of problem areas by the appropriate action agencies.

(U) The US and Iran renegotiated supply support arrangements in March 1971. The total program was valued at \$11 million. A supply support arrangement program with the Government of Israel continued during Fiscal Year 1971, with a dollar value of \$3.9 million. The Japanese Air and Ground Self Defense Forces renewed their supply support arrangement program with the US on 1 May 1971. The program was valued at approximately \$5.4 million which was an increase of \$.6 million over the prior year program. The Hawk and Nike Hercules guided missile systems were supported by this arrangement. Also foreign military sales orders for NATO Hawk production were renegotiated in March 1971. The total dollar value of the NATO Hawk supply support arrangement program for CY 1971 was \$8.8 million, which was an increase of \$.6 million over the prior year program. The existing New Zealand contract, which continued during Fiscal Year 1971, provided for support of both the New Zealand Army and Air Force. The New Zealand program was valued

at \$1.2 million, which represented a slight increase over the prior year program.

(U) The US negotiated its supply support arrangement with Norway in December 1970. The contracts, which provided support for 36 end items for the Royal Norwegian Air Force and Army, totaled \$6.1 million. Anticipated increased support of helicopters for the Norwegian Air Force in CYs 1971 and 1972 was expected to increase the program value. Support arrangements with Saudi Arabia continued through Fiscal Year 1971. The total program valued at \$4.7 million was an increase of \$.7 million over prior year. Revised arrangements with Spain covered a continued support program valued at \$4.1 million. The US-United Kingdom supply support arrangement, which was renegotiated in June 1971, totaled \$1.2 million. This was a slight increase from the prior year program.

Support of Major Weapon System Items in MAP Countries

(U) The Army objective was to transfer the support role for MAP end items to industry wherever possible. Currently, the AMC was developing phase-out plans for the M47 Tank and the following other items: Armament Subsystem, Helicopters, 7.62 mm M6; Machine Gun, Caliber .30, M1917A1; Mount, Tripod, MG Caliber .30, M1917A1; Gun, subcaliber, 37mm, M13; Mount, Tripod, rifle, M1917A2; Gun, towed, 155mm, M59; and ANGRC 26, ABC Radio. Plans for supporting all of the above items were to be furnished each country, involved along with the recommendation that repair parts be purchased through the US Army, with subsequent support to be obtained from industry.

Free World Support-Grant Aid

(U) The Free World Support Division of the Directorate of International Logistics was charged with the responsibility for directing the accomplishment of the Free World Support Program consisting of the Grant Aid, Service Funded Military Assistance, and Civilian Air Programs. With the announcement of the Nixon Doctrine the mission of this Division took on new importance as international policies shifted. The following pages highlight some of the significant actions accomplished by the Free World Support Division in support of the current foreign policy.

(U) Under the Nixon Doctrine, the US advised the nations to which it gave aid that our policy would be "their men and our materiel." In order to support the Nixon Doctrine, the US adopted the following policy:

"First, the United States will keep all of its treaty commitments."

"Second, we shall provide a shield if a nuclear power threatens the freedom of a nation allied with the US."

"Third, in cases involving other types of aggression, we shall furnish military and economic assistance when requested in accordance with our treaty commitments but we shall look to the nation directly threatened to assume the primary responsibility of providing the manpower for its defense." ¹²

ARVN Modernization and Improvement

(U) The modernization and improvement of the Army of Vietnam (ARVN) was one of the highest priority programs within the Department of Defense. The success of the Vietnamization process, on which US troop

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Presentation, "The Nixon Doctrine", Directorate of International Logistics, Hq., AMC, provided by William Levitt, Directorate of International Logistics, 18 Jan 73. This was the standard presentation for orientating new AMC personnel.

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withdrawal hinged was directly dependent upon the Army Materiel Command's ability to meet the requirements imposed under this program.

(U) During this fiscal year, the Army established a project for the intensive management of items considered critical to the Vietnamization Program. The International Logistics Directorate was responsible for monitoring the movement of these items, and for insuring that supply was accomplished according to the Joints Chiefs of Staff time-phased requirements. The number of items on this listing varied according to the availability and sensitivity of items required to insure the successful completion of the Vietnamization Program.

(U) After its inception, the project for completing the Vietnamization Program commanded high level interest within the Department of Defense. With the American troop withdrawal, then dependent upon the success of the Vietnamization Program, the AMC conducted monthly briefings for the Deputy Assistant Secretary of the Army on the status of the program. Due to vigorous follow-up and the excellent participation by the AMC subordinate commands and depots, this program which had included as many as 250 separate items, consisted of only 37 items at the end of Fiscal Year 1971. Only 15 of the 37 were considered sufficiently critical to warrant briefings to the Deputy Assistant Secretary.

US Programs in Korea--ROK Modernization

(C) Concurrent with the withdrawal of approximately 20,000 US Forces personnel from the 8th US Army by 30 June 1971, Congress, by the Special Foreign Assistance Act of 1971, authorized the President to transfer to the Republic of Korea (ROK) such Defense articles as the President might determine. The authority to transfer materiel to

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the ROK Government was delegated to the Secretary of Defense on 9 February 1971. The applicable Public Law specifically stated that no funds appropriated under the Act would be available for reimbursement to any agency of the US Government for any materiel transferred to the ROK Forces under the Act.

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(C) In order to effectively record materiel authorized for transfer, programing data was fed into the Department of Defense by CINCPAC as the materiel was transferred. The items transferred were identified and MAP data were transmitted to the Army International Logistics Center. The estimated acquisition value of materiel to be transferred was \$240 million. All items were to be transferred in an "as is" condition. In view of the average condition of materiel, the Secretary of Defense indicated that one third of the acquisition cost would be utilized for record purposes.

(C) As of 10 June 1971, US Eighth Army materiel valued at \$91.5 million had been transferred to the ROK Army. The AMC anticipated that the bulk of remaining items would be transferred during the first quarter of Fiscal Year 1972.

Moratorium on Shipment of Major Items to Vietnam

(U) In May 1971, the AMC Headquarters imposed a moratorium on CONUS supply of major items to the Republic of Vietnam. Vietnam major item requirements were to be filled from materiel available in the Pacific area, insofar as possible. Shipment of items from CONUS was to be resumed only on those items determined to be unavailable from theater

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PL 91-652, 5 Jan 71, subj: Special Foreign Assistance Act of 1971.

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supply sources. This practice resulted in substantial savings on items made available from theater stock and transfers within Vietnam.

MAP Utilization of Excess Major Items

(U) In January 1969 OSD initiated a program to allow major items in long supply to be used to fill MAP requirements in shortfall category. In May 1969, OSD expanded this program to include items that could conceivably be utilized for MAP, including items not included in defined shortfall requirements and items which could be made available for MAP on an "as is", "where is", non-reimbursable basis, due to age and condition, even though there was no worldwide long supply.

(U) During Fiscal Year 1971, the US Army contributed major items with a total acquisition value of over \$675 million. Requirements were identified and MAP orders issued for \$205 million. There were no MAP requirements for \$320 million, and \$150 million was still open at the end of the fiscal year. The significant dollar value of open offers was partly due to the Congressional limitation of \$300 million on excess programs.

(U) DOD developed a procedure for the transfer of MAP assets geographically located in the Pacific Command (PACOM) directly to PACOM recipient countries, to fill requirements, without costly transfer of items to or from CONUS.

(U) In January 1971, the OSD announced that a congressional limitation of \$300 million acquisition value had been imposed on DOD for Fiscal Year 1971 long supply and excess materiel program authorization. This excluded Military Assistance Service Funded programs, as well as requirements for redistributable MAP property. During Fiscal Year 1971, the

US Army offered major items with a total value in excess of \$600 million, but full utilization was constrained by congressional limitation. In the fourth quarter of Fiscal Year 1971, the \$300 million ceiling was reached, with the Army's share reaching approximately \$185 million. MAP orders for requirements in excess of \$300 million were to be issued early in Fiscal Year 1972 against the Fiscal Year 1972 ceiling. At the end of Fiscal Year 1971, the OSD was attempting¹⁴ to get the ceiling raised for Fiscal Year 1972.

2nd Logistics Command

(U) During the fourth quarter of Fiscal Year 1971, the Army Materiel Command established the first formalized procedure whereby Pacific Command Military Assistance Program countries would utilize long stocks and excess assets located within the 2nd Logistics Command. A list of items available from the Command was provided for the US Army International Logistics Center (ILC). The ILC screened MAP requisitions against that list and passed requisitions to the 2nd Logistics Command if and when a "match" occurred, which, during Fiscal Year 1971, was successful on a 20 percent basis only. The 2nd Logistics Command passed the requisition back to ILC for CONUS supply. It was anticipated that the percentage of matching excess assets with requirements would improve considerably as additional items were identified at the 2nd Logistics Command.

Delivery/Billing Card System

(U) A new delivery/billing card system for reporting MAP Grant Aid,

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The information used in this chapter is based on the USAMC International Logistics Directorate Historical Summary, FY 1971, unless otherwise indicated.

[REDACTED]

Service Funded and Free World Support deliveries was put into effect on 1 July 1970. This system proved to be successful at the supply agencies and reactions were very favorable at the International Logistics Center.

(U) The year-end reports for Fiscal Year 1971 indicated that approximately 591,000 cards, representing a dollar value of \$1,630,572,135 were processed. This was a very large volume of cards, prepared under entirely new formats. During the year, changes and refinements to the system were made, and corresponding adjustments by the supply agencies were required. Even under these difficult circumstances the rate of accuracy in the cards submitted to International Logistics Center for processing was considered very good. In fact, only 4.3 percent of the 591,000 cards submitted were rejected during computer editing. It was anticipated that continuing improvements would be made to the card system. Under consideration were provisions for collection data card feedback to supply agencies from the Finance and Comptroller Information Systems Command, which provided a mechanical means for updating accounts receivable records, a projected expansion of the card formats to furnish a better method of reporting credit allowances, and further refinement of card edit procedures.

Ammunition Shipment to Central and South America

(U) The US Navy Ship, MIRFAK was scheduled for the annual sailing to Central and South America in March 1971. However, only 68 measurement tons were offered for this sailing. Because of the lack of tonnage, the Commander of the Military Traffic Management and Terminal Service proposed to establish an on-berth date in October 1971 for the next

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annual sailing. Headquarters, AMC concurred in the October 1971 on-berth date for the MIRFAK. Consolidated shipment of ammunition from the Army, Navy and Air Force was carried annually by this ship for both Grant Aid and Foreign Military Sales.

Suspension Lifted on Items for Greece

(U) On 23 September 1970, the selective suspension of MAP items to Greece was lifted. This suspension had been in effect since April 1967. Materiel valued at \$42 million was in suspended status. The lifting of the suspension would allow delivery of this materiel over the next three-year period. Consequently, there was not expected to be any adverse impact, since the materiel was not to be expedited.

(U) Among the Grant Aid items that had been suspended from shipment to Greece were the following: tanks, howitzers, guns, recovery vehicles, personnel carriers, and helicopters. Fifteen of the tanks to be shipped to Greece were in Leghorn, Italy, as were fifteen bulldozer blades. Some of the materiel that was to be redistributed to Greece, such as recovery vehicles, self-propelled guns and 90mm ammunition, were in Europe.

Grant Aid to Ecuador, Ceylon, Iran and Jordan

(C) Materiel deliveries to Ecuador were suspended on 9 February 1971, except for shipments in the pipeline enroute to that country. The suspended program consisted primarily of spare parts and MIMEX vehicles. The US Military Group, Ecuador, was closed on 4 March 1971. 15

(U) On 26 April 1971, the AMC received the DOD MAP order which authorized the shipment to Ceylon of \$72,000 worth of repair parts for Bell

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(1) DA Msg. 091614Z, Feb 1971. (2) COMUSARO Msg. 122032Z Mar 1971.

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Helicopters in that country. This shipment was airlifted within the specified time. In another Grant Aid action, AMC replaced 974 CVC Helmets to make them compatible with radios already in the country of Jordan. All of the helmets were shipped on 3 July 1970.

(U) During this fiscal year, the Department of the Army and STRATCOM approved a proposal for Imperial Iranian Gendarmerie radios to replace those already in that country that had been found to be defective.¹⁶ Iranian representatives visited STRATCOM and the vendor's plants in late June 1971 but did not make a final selection of replacement radios. Vendors were in Iran, at the close of Fiscal Year 1971, demonstrating their products.

(U) In January 1971, OSD, through the Department of the Army, directed shipments of selected items to Jordan. All commitments were met by 6 May 1971. In June 1971, DA directed shipment of 14 additional M60A1 Tanks to Jordan. These tanks were to be made available by 29 August 1971.¹⁷ No problems were expected in meeting this requirement.

Foreign Military Sales

Scope of the Military Sales Program

(U) The Army World-wide Military Sales Program, from the date of its inception to 30 June 1971, totaled \$5.406 billion. The active Fiscal Year 1971 program totaled \$3.034 billion of which \$550 were new sales

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STRATCOM Msg. 212257Z, May 1971.

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DA Msg(s) 072053Z, June 1971.

made in Fiscal Year 1971. The major countries making purchases during that fiscal year were as follows (in million dollars): Brazil--\$38, Republic of China--\$30, Federal Republic of Germany--\$95, Iran--\$38, Israel--\$132, and Jordan \$27. The major items of equipment included in those sales were helicopters, missiles, personnel carriers, tanks, combat vehicles, howitzers, guns, trucks, ammunition, communication equipment, and repair parts. Worldwide deliveries against the Army Foreign Military Sales Program totaled \$411 million for Fiscal Year 18 1971.

FY 1971 Foreign Military Sales (FMS) Close-out Program

(U) The AMC established its Fiscal Year 1971 FMS Case Close-out Program by letters issued in May and July 1970.¹⁹ The objective was to close out 827 Fiscal Year 1968 and prior year cases and 568 Fiscal Year 1969 cases. The Command actually closed out 590 cases in the first category and 556 cases of those in the Fiscal Year 1969 period. This accomplished 83.4 percent of the Fiscal Year 1971 objective. AMC closed out 849 additional cases, not included in the FMS close-out program, for a total of 1,995 cases, valued at \$673 million. This was the highest number of cases completed in a single fiscal year after the inception of the FMS program.

Foreign Military Sales (FMS) Management Reviews

(U) The FMS management review was an in-depth review of a customer's total program, and provided an overall analysis of both the supply and

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The above data was extracted from the DOD ISA (Q) 1032 Report as authorized by AR 795-24.

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(1) AMC Ltr. AMCIL-MR, 21 May 70. (2) AMC Ltr. AMCIL-MR, 9 July 70.

financial status of the program. Dependent upon the desires of the customer, the analysis was either furnished to their representatives for individual review or a joint review was made by the US Army and country representatives. Joint reviews could be held either in-country or within CONUS. Of a total of 24 country programs scheduled for review during Fiscal Year 1971, twenty one were completed within the timeframe, one was cancelled by DA, and 2 were retargeted and completed by 29 July 1971. During this fiscal year, seven in-country reviews were conducted. These reviews included China, Denmark, Italy, Iran, Japan, Switzerland, and Venezuela. The remaining reviews were either conducted in CONUS, or coordinated by correspondence.

FMS Shipments of Small Arms and Small Arms Ammunition

(U) In August 1970 the DA advised the AMC that pilferage of small arms and small arms ammunition had become a matter of increasing concern to DOD and to law enforcement agencies. During this year, the AMC took steps to tighten security while this materiel was in transit. The USAMC was required to take the following actions to insure the security of these items while in the custody of the freight forwarders: (a) withhold all shipments on a country by country basis until DA advised that the shipment could be released; (b) when preparing future letters of offer involving items of this nature, the purchaser was to be advised that the release of shipments by the US Army was contingent upon the freight forwarder taking necessary precautions to safeguard the materiel; and (c) in conjunction with liaison visits to freight forwarder facilities, AMC personnel were to review the provisions for safeguarding small arms and small arms ammunition.

Recovery of Unfunded Costs

(U)On 18 December 1970, the AMC provided guidance for the National Inventory Control Points which required them to bill FMS customers and recoup all unfunded costs involving the manufacture, overhaul, rebuild, or assembly of materiel at Army Industrial Fund (AIF) installations, when the items were rebuilt specifically to meet FMS requirements. All FMS work orders and case numbers were to be separated to prevent intermingling with Army requirements. Letters of Offer made on or after 1 January 1971 had to include AIF costs in the unit price of the item.

Exceptions Concerning FMS Title Transfer

(U)According to DA policy all FMS shipments were to transfer title at the FOB US point of origin. However, there were instances in which the AMC found that this policy should be changed. In December 1970, the Command requested that the following exceptions be made to the DA policy: on shipments to countries that did not have freight forwarders; shipments of classified items to all FMS customers; shipments of ammunition and other hazardous cargo that required special handling; shipments to freight forwarders that maintained warehouse facilities at the Port of Exit; and on Stock Fund items sold at standard prices which included second destination transportation charges. In most cases, DA approved exceptions in the delivery terms requested by the AMC.

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(1) DA Ltr, LOG-MS-SB2, 4 Aug 70. (2) AMC Ltr, AMCCP-FG, 18 Dec 70.

21

AMC Ltr, AMCIL-MS3, 9 Dec 70, and DA 1st Ind. LOG-FMSD-11142, 17 Dec 70.

[REDACTED]

Updating PERSHING Tank System

(U) During January 1969, the Federal Republic of Germany (FRG) purchased equipment and repair parts to update the German PERSHING 1 systems to PERSHING 1A configuration. The total value of that purchase was \$126 million. To insure an orderly and economical conversion to the 1A version, in December 1969, the US accepted an FRG PERSHING exchange program which encompassed the following activities: establishment of a joint US/FRG control office at the Martin Marietta site, Cape Kennedy, Florida, and at German Air Force Headquarters at Porz-Wahn, Germany; preparing materiel for shipment from Cape Kennedy, Florida, to three exchange sites in Germany; modification of PERSHING 1 items for mating with PERSHING 1A equipment; and serviceability tests and demonstrations at German exchange sites prior to final release of equipment to German Air Force Units. The initial shipment of items under this program was made from Cape Kennedy in November 1970.

(U) A large quantity of major items, repair parts, and publications were shipped from Cape Kennedy on 23 February 1971 and were received at Landsberg on 12 March. Several required erector launches were damaged by a fire aboard a German vessel and, therefore, could not be shipped until 13 March 1971. Maintenance checkout and turnover of this equipment for the 1st Training Platoon was completed at Norvenich, Germany prior to 31 March 1971. The maintenance checkout and turnover of 1st Wing equipment was completed at Landsberg, Germany on 28 May 1971.

(U) Equipment for the 2nd wing, including major items, publications, and repair parts were scheduled for shipment from Cape Kennedy in

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August 1971. The Cape Kennedy site for this activity was scheduled to be closed out by 15 November 1971. The maintenance checkout and turnover of 2nd wing equipment was scheduled to be completed at Giehenkirchen, Germany by 15 December.

Basic Towed Hawk Battalion for Greece

(C) On 17 August 1970, the AMC at DA request, directed the Army Missile Command to expedite the preparation of an offer for sale of a basic towed Hawk battalion to Greece.²² This offer was cancelled and a Letter of Offer for \$11.5 million was submitted to DA for approval in May 1971. Later in 1971 this offer was suspended pending further advice. The basic reason for suspension was that the required equipment was to come from a US Hawk Battalion scheduled for inactivation during Fiscal Year 1973. The Secretary of the Army was to review the Hawk availability situation periodically to keep the AMC advised.

Military Sales to Israel and Japan

(C) The Israel Arms Package consummated in Fiscal Year 1971 consisted of 19 sales cases valued at \$113.2 million. The major items consisted of 175mm guns, recovery vehicles, personnel carriers, ammunition carriers, M48A1 tanks, M60A1 tanks, and Hawk missile systems. Most of these items were to be delivered by March 1972.

(C) On 26 April 1971, Israel accepted a Letter of Offer valued at \$13.6 million for 300 personnel carriers and related support equipment. Delivery was to be completed by 26 April 1971.

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DA Msg DCSLOG-MS-SB2, 17 Aug 70.

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(C) Plans were underway during this year for the sale of Nike Hercules and Hawk missile equipment to Japan. Four Letters of Offer for this materiel, totaling \$31 million, were presented to Japan by a US team that was negotiating the reversion of Okinawa to Japan. The sale was expected to be consummated about 1 April 1972.²³

Sales to Jordan

(C) The US military sales program for Japan consisted of a wide variety of items. The 1970 Jordan Arms Package, which was established in June 1970, consisted of twin 40mm guns; 107mm mortar; 105mm, 8-inch, and 155mm towed howitzers; 155mm self-propelled howitzers; 10-ton cargo trucks; radar surveillance equipment; and tools and spare parts. The value of this materiel was estimated at \$23 million. In July 1970, the sale of ammunition and communications equipment increased the program value to \$46.1 million. Major changes in the program in August reduced the 1970 Jordan Arms Package to \$38.6 million.

(C) A revision of the Arms Package in September 1970, including amendments and new offers, brought the estimated value to \$54.3 million. In November 1970, additional changes in ammunition and communications requirements, and cancellation of support equipment and technical representatives for Navy materiel, led to revised sales estimates. A December 1970 study encompassed communications equipment, combat vehicles, weapons, tanks, ammunition and generators. The revised 1970 Jordan Arms Package including amendments and new offers presented to DA was approximately \$45.3 million.

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(1) DA Msg DCSLOG-FMS-SB2, 5 Feb 71. (2) CMDAO Tokyo

Msg CMP8059, 14 May 71.

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(C) In January 1971, DA requested price and availability data on lists of materiel extracted from the 7 December 1970 Report of DOD Military Survey Team to Jordan. The new requirements covered trucks, tanks, armored personnel carriers, howitzers, tank recovery vehicles, small arms, ammunition, communications equipment, helicopters, spare parts and special tools. The estimated value of this planning program submitted to DA in January 1971, was \$136.7 million.

On 20 January 1971, DA requested that a detailed study be made on five alternative plans for providing Jordan with tanks with 105mm guns. WECOM prepared the study, which AMC presented to DA on 22 February 1971, with recommendations to use M48A1 tanks up-gunned to M48A5s. OSD and DA requested additional information on this program, which the M60 Tank Project Manager provided in April 1971. The Project Manager proposed that time be saved by up-gunning M48A3 tanks to M48A5 tanks.

(C) In May 1971, a team of senior Jordan Arab Army officials visited the US to complete negotiations on the Fiscal Year 1971 Jordan Arms Package. The OSD made the decision to furnish Jordan with M60A1 tanks as well as the entire arms package under the Grant Aid Program except 28 M60A1 tanks. These tanks were to be provided under the Military Sales program during Fiscal Year 1972.

Restriction of Military Sales Shipments to Pakistan

(C) Effective 26 April 1971, Department of Army release authority was required on a case by case basis for shipment of ammunition and repair parts for lethal end items to Pakistan. During this year policy was amended as follows: All shipments to Pakistan from depot stocks were directed to New Cumberland Depot to await further guidance; no

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new procurement actions were to be initiated to fill Pakistan requirements; all current requisitions in the supply system were cancelled except those on procurement; all materiel in storage at Army depots was to be returned to original depot stocks to fill Army and other requirements; and all materiel in ports was to be held pending further DA guidance. Any further problems were to be referred to DA.²⁴

Military Sales to Peru

(C) Military sales to Peru during Fiscal Year 1971 were relatively small. In July 1970, the DA instructed the AMC to prepare a Letter of Offer for sale of five UH-1H²⁵ helicopters to Peru. These helicopters were currently in Peru. The US had loaned these helicopters to Peru for use in disaster relief, as a result of an earthquake in that country. On 1 September 1970, the US forwarded a Letter of Offer for the five helicopters to the Government of Peru. However, on 7 October 1970, DA informed the AMC that Peru had declined the offer.

Loan Agreements with Republic of China

(C) Over a period of years, the Republic of China and the United States entered into several loan agreements in support of co-production and military sales programs and commercial purchases in the United States. Over a period of years the funds involved in these agreements totaled \$126 million. The two countries negotiated agreements for programs valued at \$41 million during Fiscal Year 1971. They entered into

²⁴ DA Msg DCSLOG-FMS-SB2, 26 Apr 71.

²⁵ DA Msg DCSLOG-MS-SB2, 29 Jul 70.

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the other agreements for the remaining \$85 million over a period of
26
years, from 1966 to 1970.

Remark by Director of International Logistics

(U) "The multi-million dollar international logistics business has
been very successful during Fiscal Year 1971 due partially to the
innovations in process to cope with the constant increase in volume
27
and complexity of the program."

26
AMC Directorate of International Logistics Historical Summary,
FY 1971, p. 40.

27
Ibid., p. 41.

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CHAPTER X
QUALITY ASSURANCE

Value Engineering

(U) The Product Assurance and Value Engineering 5-Year Program (FY 1971-75) provided the major subordinate commands, depots, and other participating activities with the command objectives for the Value Engineering mission. Under the Resources Conservation Program the reported Value Engineering effort validated savings for Fiscal Year 1971 totaled \$11,753,800. This accomplishment exceeded the assigned dollar goal by 172 percent.

(U) While the in-house Value Engineering Proposals (VEPs) assigned objective was exceeded by 44 percent, the number of contractor Value Engineering Change Proposals (VECPs) fell 27 percent below the assigned objective. The number of VEPs received numbered 1425 as against 597 VECPs. This shortfall in the VECPs program was due to two factors. First, Defense Procurement Circular 73 in Fiscal Year 1970 disallowed the Value Engineering Incentive Clause in the Cost-Plus-Awards-Fee contracts; and second, cutbacks in Government spending affected the Value Engineering Program.

(U) Throughout this fiscal year, specific emphasis was given to the AMC subordinate commands' Value Engineering Programs. In support of this emphasis, a two-day Value Engineering Managers Conference was hosted in December 1970 by the US Army Missile Command. The occasion permitted the personal exchange of ideas and techniques, and provided additional motivation for value engineering activities.

*Preparation of this chapter was based on FY 71 Annual Historical Summary submission from Directorate for Quality Assurance, 20 Aug 71.

Quality Engineering

Reliability Improvement of Selected Equipment

(U) A program of Reliability Improvement of Selected Equipment was begun in September 1969. The objectives of the program were: (1) to survey the performance of all AMC equipment in order to identify components that contributed most to performance degradation and logistic support cost; (2) to analyze those components identified in order to determine the degree of reliability improvement that could be made; and (3) to implement reliability improvement programs for those components offering the greatest return on investment in terms of alleviating performance degradation and/or reducing the life cycle cost of equipment ownership.

(U) During 1970 the seven AMC commodity commands identified 135 potential candidates for reliability improvement, with an estimated cost avoidance of \$293 million. Approximately 80 projects, with a potential cost avoidance of \$120 million, were under way, or proposed for funding.

Ballistic Acceptance Test Problems on the M564 MTSQ Fuze

(U) During this year, the Judge Advocate General's Office requested the Director of Quality Assurance to act as the focal point within the Army Materiel Command for the provision of technical and staff assistance to the government before the Armed Services Board of Contract Appeals. This assistance related to defense against the complaint of the Hamilton Watch Company on the M564 MTSQ Fuze. To aid in giving this assistance, the Director met with US Army Munitions Command

product assurance personnel and the government's chief trial attorney.

(U) Arrangements were made at the meeting for the analysis of pertinent test data and procedures that were to be provided by the Munitions Command, and for staff support and consultation by the Directorate of Quality Assurance. The Munitions Command initiated studies that covered government furnished materiel, equipment, and testing procedures during the life of the contract with the Hamilton Watch Company. Testing techniques and instrumentation were analyzed for bias and instrumental error. The process capability of all M564 MTSQ Fuze manufacturers were to be statistically determined to establish the natural tolerance limits for comparison with specification requirements. To be calculated were the acceptance test sampling plans for estimating the probable acceptance and rejection rate of materiel when subjected to the natural tolerance limits of a manufacturer's process. The information developed was not only to serve in the existing situation, but was to be used for the improvement of item specifications.

Control of Shelf Life Materiel

(U) During the fourth quarter of Fiscal Year 1971, a Department of Defense Value Engineering Services Office Study Report of Shelf Life was received. It pointed out the need for better shelf life control. Consequently, the AMC forwarded letters to all major subordinate commands and depots requesting them to review critically all assigned shelf life codes. Depots were to report any unrealistic codes to the responsible commodity command. The commands were to review their procedures for assigning shelf life codes, and the data accumulated

by the depots, with the objective of extending, reducing or deleting the age control requirements.

Product Operations

Calibration

(U) In November 1970, Major General James G. Kalergis, Deputy Commanding General for Logistics Support, AMC, approved the implementation of the post, camp and station calibration concept which was first recommended in 1968 by a joint AMC/CONARC/CDC study group. Consequently, during the fiscal year, AMC relocated five US Army Calibration Teams from AMC depots to USCONARC sites having heavy calibration workloads. The five teams were relocated from Pueblo, Letterkenny, Tooele, and Anniston (2 teams) Army Depots, to Fort Bliss, Fort Bragg, Fort Lewis, Fort Gordon, and Homestead-Key West.

(U) In order to achieve uniformity of mission direction, organizational interface, and costing for calibration services, the remaining four depots (Lexington-Blue Grass, Letterkenny, Sacramento, and Tobyhanna) were directed to transfer the mission and functions to their Director for Quality Control. The function was previously under the depots' Director for Maintenance.

(U) During this fiscal year, another innovation took place in the calibration field. The US Army Metrology and Calibration Center initiated action to procure two Automated Calibration Systems (AUTOCAL). Delivery of the systems was anticipated during the latter part of Fiscal Year 1972. These systems were primarily designed to facilitate rapid and precise automatic or semi-automatic calibration of high density

general purpose test and measuring equipment. They were to be evaluated to determine the practicability of future use in fixed and mobile applications within the US Army calibration system. In addition to speed and precision, the AUTOCAL concept had self-calibration capability. This feature reduced significantly the requirement for return of calibration standards for periodic re-calibration.

(U) During this fiscal year the US Army Metrology and Calibration Center Quality Assurance Inspection Program was extended to include all AMC calibration activities. Prior to this year, quality assurance inspections were directed solely toward the AMC depots that had an area support mission. This program was designed to assess the adequacy of technical performance and the integrity of measurements performed. In Fiscal Year 1972 two foreign governments requested aid in this field.

(U) During Fiscal Year 1971, the US Army Metrology and Calibration Center (AMCC) made a complete review of the calibration requirements of the armies of Turkey and Spain, respectively. The final reports provided these governments with a list of all calibration standards needed at both the transfer team and the secondary reference laboratory levels to support their Army calibration requirements. An on-site review was made in the case of Turkey since there were no records available that contained the needed information. Spain, however, was able to provide the AMCC with sufficient information so that the review could be completed at the Center. The AMC initiated procurement action for Spain's needs. Delivery was scheduled for June 1972.

CHAPTER XI

HIGHLIGHTS OF THE FISCAL YEAR

(U) In fiscal year 1971, the Army Materiel Command continued to pursue as its first priority the development, production, distribution and support of modern, reliable equipment for the US forces and its allies while, at the same time, maintaining a modern and responsive industrial base. Second only to its materiel functions was a major concern with streamlining its management techniques and organizational structure.

(U) About a billion dollars less was allocated this year than in 1970 for equipment, missile and ammunition procurement in the light of the diminishing commitment in Southeast Asia. Over \$1.2 billion involved war-related procurement as compared with \$4.5 billion in 1969; contingency procurement was excluded because an active production base was operating in the event of need, and balance could be maintained between allocations and requirements by drawing upon depot stocks and extending procurement schedules. Although consumption rates varied significantly during the period, no critical shortages occurred.

(U) There was progress in fiscal year 1971 in tailoring maintenance concepts to specific commodity and weapon systems - part of the effort to achieve maximum materiel readiness at minimum cost.

(U) Fiscal year 1971 saw the continued application of certain projects designed to reduce the number of repair parts selected and shipped with equipment as initial support items. Also disseminated during the year were standards for the maintenance, care, and

preservation of prepositioned equipment which was not covered by
existing guidance concerning materiel used in the Army's depot system. ¹

(U) Depot materiel maintenance and support funding totaled about \$668.8 million in direct obligations for fiscal year 1971, including \$515.8 million for depot maintenance activities. Additionally, a modernization program of depot storage facilities, initially started in 1967 was completed this fiscal year with an expenditure of \$12.4 million for alterations to facilities and equipment and \$2.3 million for military construction. ²

(U) A major challenge in the logistics field during this fiscal year was the planning of actions that would insure the continuation of a strong and viable logistics base in the US and around the world in a period when oversea deployment and overall strength was diminishing. Stockage policies of the Army in the field were modified. Items to be stocked below the continental US depot level were reduced from 1,063,000 in 1970 to 327,000 at the close of 1971.

(U) A number of automatic data processing systems progressed during the year. One of them was the Command's Logistics Program Hardcore Automated (ALPHA), the first phase of which became operational on 1 May 1971. It was a standard system for the wholesale management operation at the commodity command level. Later phases were to be completed by early 1972 at the prototype installation, AVSCOM at St. Louis, Missouri. The systemwide project for electronic equipment

¹
DA Historical Summary, FY 1971, p. 92

²
Ibid.

at depots extended (SPEEDEX), an information system for use at the command's depots, also become operational during the year with its first application at Letterkenny AD, Chambersburg, Pennsylvania.

(U) The command's approach to project management was characterized by constant evolution, keeping in step with policy formulated by the Office of the Secretary of Defense. From a high of 68, AMC had adjusted by the end of FY 71 to 33 project managers and three product managers. These evolutionary changes have had two positive effects: to reduce layering between the project manager, the Department of the Army, and the OSD Secretariat; and, to collocate the project managers with their technical base.

(U) The logistics posture and combat effectiveness of US Army, Europe, improved during the year as a result of the introduction of new equipment and the modernization of existing materiel. Newly developed armored reconnaissance vehicles were supplied to armored cavalry squadrons; helicopters were modernized; PERSHING equipment was converted from tracks to wheels and the HAWK to a self-propelled configuration; and air defense control centers and base defense were modernized. There were also improvements in the materiel readiness of units, in the status of war reserve stocks, and in protective construction. New communications equipment was issued and old equipment rebuilt, while Autovon facilities were extended throughout the command.

(U) The materiel portion of the 1971 Army Military Assistance Program (MAP), Grant Aid, totaled \$729 million and included varying degrees of support for countries and international organizations. Grant aid recipients received \$299 million in materiel, for which the Army was

reimbursed, and \$270 million without reimbursement during the fiscal year. Materiel delivered was predominantly from prior year undelivered balances or from excess Army stocks. In fiscal year 1971, the Army sold materiel and services valued at \$540.6 million to fifty-eight countries and five international organizations. In conducting its sales activities the Army adhered to the policy that materiel readily available through commercial sources would be sold by US industry directly to the recipient country.

(U) International logistics management activity was broadened during the year to place increased emphasis on planning and provisioning for current and near year requirements. As US Army procurements were reduced or acquisition objectives were satisfied, it became necessary to seek total 1971 fiscal year funding and some advance 1972 funding for international logistics customer requirements. This action was taken to combine procurement and take advantage of contract options. Major item groups were reviewed for possible procurement of equipment peculiar to international logistics program customers. When an item can no longer be provided economically by the US Army supply system, it will be withdrawn; US industry would provide direct support to countries on commercial items.

(U) Under the impetus of a large-scale guerrilla-type war in Southeast Asia, important advances were made in US enemy detection capability--the result of increased emphasis in the fields of surveillance, target acquisition, and night observation (STANO).

(U) STANO technology, coupled with advances in automatic data processing and communications made significant contributions toward an integrated battlefield control system that materially assists the tactical commander in making sound and timely decisions.

(U) In the night vision area, technology was advanced through exploitation of the techniques of image intensification and thermal imagery. Comparative testing of various aerial night vision systems was completed by the Modern Army Selected Systems Test, Evaluation, and Review (MASSTER) test facility at Fort Hood, Texas. In these tests, FAAR infrared systems were considered to have high potential for the future.

(U) During Fiscal Year 1971, the development programs of the mechanized infantry combat vehicle (MICV) and the armored reconnaissance vehicle (ARSV) were reoriented to some degree. In the fall of 1970, the ARSV program was modified to place it on an austere footing. In the early months of 1971, the mechanized infantry combat vehicle program development goals were broadened and both the MICV and ARSV programs were directed along austere lines with the MICV receiving the first priority in the event that future fiscal constraints require a priority determination.

(U) The Army's main battle tank, designated the MBT-70 under the former joint development program with the Federal Republic of Germany and redesignated the XM-803 under the US unilateral continuation program, progressed during the year through design review and to definition of the revised configuration. Fabrication of advanced production engineering pilot tanks proceeded. These tanks will be used for

engineering and expanded service tests. First production is scheduled for December 1975. Despite the major changes in the program, the production schedules set under the previous co-operative effort remained in phase.

(U) With respect to the XM-803 engine, a source of concern to congressional committees, the United States returned to the air-cooled piston engine that had been dropped in favor of the German liquid-cooled engine. The reversion was made after study by military panels and after a detailed review by independent experts. It represented in comparison with any existing production engine in its class, an unprecedented engineering accomplishment in terms of both power per cubic foot and power per pound.⁴

(U) In the missile field, deployment of the TOW antitank system to the training base in the continental United States was essentially completed during the year. This tube-launched weapon will replace the 106-mm recoilless rifle and will improve the ability of US forces to counter the armor threat that has existed in Europe since World War II. Development of the Dragon System also advanced during the year.

(U) In the area of helicopters, there was progress in a number of actions taken. In October 1970, funds were released for a joint Army-Navy heavy lift helicopter (HLH) program. The research and development program for an advanced aerial fire support system continued in the course of the year. A prototype AH-56A Cheyenne equipped with an improved rotor control system was flown and previous instabilities

⁴

DA Historical Summary, FY 71, p. 111.

were overcome. Fabrication and ground test of the night vision system was completed and installation on an AH-56A initiated. Meanwhile, aerial firings of the TOW missile system were successfully conducted by Army gunners, with promising results for the Cheyenne system. Attention was given during the year to aircraft electronics warfare self-protection equipment. Equipment, devices, and techniques encompassed the entire range of electromagnetically controlled air defense weapons.

(U) Last but not least, there were improvements made in conventional munitions particularly with respect to the use of submissiles and methods of fragmentation control.

(U) As of the end of June 1971, AMC had some 152,000 people of whom only 14,000 were military. Troop strength steadily declined since the command's creation. During its relatively short life, the Army's

largest organization has overcome many crises and, through it all,

AMC STATISTICS (as of 1 Jul 1971)

Manpower	
Military	13,791
Civil Service	136,450
Contractor (estimated)	48,751
Total (estimated)	198,992
Funds, FY 1971 (includes carryover)	
	Millions
Program (total obligational authority)	\$7,939
PEMA	\$4,980
RDTE	\$1,226
OMA	\$1,703
MAP	\$ 20
Other	\$ 10
Army Stock Fund (obligational authority)	\$1,046
Army Industrial Fund (Revenue)	\$1,136
Physical Plant	
Acreage (thousands)	4,783
Acquisition cost (estimated in millions)	\$6,146
Number of installations	83
Number of activities	102
Workload Indicators	
Value of goods and services delivered (estimated in millions)	\$8,963
Number of items managed (thousands)	582,274
World-wide inventory value (estimated in billions, AMC-owned)	\$28.7
Short tons received and shipped (millions)	3.47
Short tons in storage (millions)	8.56
Demands received (millions)	3.30
Number of project & product managed systems	41

⁵ FY 71 Resource Data Book and Fact Book (AMC Pamphlet 1-5), 1 Jul 71.

successfully supported forces in the field with remarkable reliability. In the words of the Commanding General spoken not long ago, "The challenges which lie ahead--the 'trials by fire' of the imagination and decision-making toughness of the Army's materiel experts--do constitute a worthy task for a man or woman who wants to contribute, to be involved, to influence the future of Army logistics".

⁶
Article in 1971 Army Green Book, by Gen. H. A. Miley, Commanding General, AMC, entitled 'AMC Streamlining Aims to 'Put it all together.''

GLOSSARY

AAP	Army Ammunition Plant
AASVCO	Army Aircraft Survivability in Vietnam Combat Operations
ABDMA	Advanced Ballistic Missile Defense Agency
ACAM	Army Class Manager Activities
ACMA	Army Class Manager Activity
ACS/CVET	Automatic Checkout System for Combat Vehicle Engines & Transmissions
ACSA	Army Communication Systems Agency
ACSI	Asst Chief of Staff-Intelligence
AD	Army Depot
ADAFSS	Army Direct Aerial Fire Support Study
AEC	Atomic Energy Commission
AERB	Army Educational Requirements Board
AID	Agency for International Development
AIF	Army Industrial Fund
ALMC	Army Logistics Management Center
ALMSA	Automated Logistics Management Systems Agency
ALPHA	AMC Logistics Program Hardcore-Automatic
ALT	Administrative Lead Time
AMC	Army Materiel Command
AMCQA	AMC Quality Assurance
AMETA	Army Management Engineering Training Agency
AMPS	Automatic Message Processing System
AMS	Army Management School
AOC	Army Operations Center
APC	Armored Personnel Carrier
APG	Aberdeen Proving Ground
ARADCOM	Army Air Defense Command
ARPA	Advanced Research Projects Agency
ARSV	Armored Reconnaissance Scout Vehicle
ARVN	Army of Vietnam
ASA ITL	Assistant Secretary of the Army (Installations & Logistics)
ASD ITL	Assistant Secretary of Defense (Installations & Logistics)
ASL	Authorized Stockage List
ASRS	Automatic Storage and Retrieval System
ATCC	Automatic Telecommunications Center
ATE/ICEPM	Automatic Test Equipment/Internal Combustion Engine Powered Materiel
AUTODIN	Automatic Digital Network
AUTOSEVOCOM	Automatic Secure Voice Communications
AVSCOM	Aviation Systems Command

BOMAT	Bomblet Anti-Tank (non-nuclear warhead)
CAD-E	Computer-Aided Design and Engineering
CBE	Cost Budget Estimate
CBR	Chemical and Biological and Radiological
CCDP	Commonwealth of Canada Defense Production
CCM	Commodity Command Management
CCMIS	Commodity Command Management Information System
CCTV	Closed Circuit Television
CDC	Combat Developments Command
CFR	Code of Federal Regulations
CFP	Concept Formulation Phase
CIRCOL	Central Information and Control-on-Line
COA	Comptroller of the Army
COMSEC	Communications Security
CONARC	United States Continental Army Command
CONUS	Continental United States
CPFF	Cost-Plus-Fixed Fee
CPRP	Civilian Personnel Reduction Plan
CSJF	Case Study and Justification Folder
DA/DCSLOG	Dept of the Army/Deputy Chief of Staff for Logistics
DASA	Defense Atomic Support Agency
DCA	Defense Communications Agency
DDRE	Director, Defense Research and Engineering
DEPMIS	Depot Management Information System
DHARS	Doppler Heading Attitude Reference System
DIMES	Defense Integrated Management Systems
DLSC	Defense Logistics Services Center
DMS	Defense Materials System
DMUP	Defense Material Utilization Program
DNSS	Defense Navigation Satellite System
DSA	Defense Supply Agency
DSCS	Defense Satellite Communications System
DSS	Direct Supply Defense
EAR	Experimental Array Radar
ECOM	Electronic Command
EEO	Equal Employment Opportunity
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
ENSURE	Expediting Non-Standard Urgent Requirement for
EPPL	Emergency Production Planning List
EOH	Equipment on Hand
ETF	Engineering Test Facility
FAA	Federal Aviation Administration
FAAR	Foward Area Alerting Radar
FAE	Fuel Air Explosive
FASCAM	Family of Scatterable Mines

FED	Final Engineering Design
FIO	Foreign Intelligence Officer
FLIR	Forward Looking Infrared
FMO	Furnishings Management Office
FMS	Foreign Military Sales
FRG	Federal Republic of Germany
FSN	Federal Stock Number
GADES	Gun Air Defense Effectiveness Study
GAO	General Accounting Office
GOCO	Government-Owned, Contractor-Operated
GSA	General Services Administration
GSEF	Ground Subsystem Evaluation Facility
GTED	Gas Turbine Engine Division
HELMS	Helicopter Malfunction System
HDL	Harry Diamond Labs
IAC	Industry Advisory Council
I&L	Installations and Logistics
ICECS	Increased Capacity Environmental Control System
ICP	Inventory Control Point
ILC	International Logistics Center
ILSP	Integrated Logistic Support Plan
IMSO	Initial Material Support Office
INDOCOM	Indonesian Communications
IPG	Issue Priority Group
IPR	In-Process Review
IR	Infra-Red
JCS	Joint Chiefs of Staff
JLRB	Joint Logistics Review Board
JOPS	Joint Operating Procedures
LATIS	Lightweight Airborne Thermal Imaging System
LDC	Logistic Data Center
LDMX	Local Digital Message Exchange
LET	Lincoln Experimental Terminal
LIF	Logistic Intelligence File
LSPC	Logistic Systems Policy Committee
LLL	Low Light Level
LSSA	Logistic Systems Support Agency
MAAG	Military Assistance Advisory Group
MAC	Maintenance Allocation Chart
MAP	Military Assistance Program
MASSTER	Mobile Army Sensor System Test Evaluation and Review
MATCOMEUR	Materiel Command Europe
MBT	Main Battle Tank
MCA	Military Construction, Army
MECOM	US Army Mobility Equipment Command
MEP	Mobile Electric Power

MERDC	Mobility Equipment Research & Development Center
METSAT	Meteorological Satellite
MICOM	Missile Command
MICV	Mechanized Infantry Combat Vehicles
MIDA	Major Item Data Agency
MIK	Missile Installation Kit
MOBDES	Mobilization Designation
MMT	Manufacturing Methods and Technology
MRO	Materiel Release Orders
MTBF	Mean Time between Failure
MUCOM	Munitions Command
MWO	Modification Work Order
MYP	Multi-Year Procurements
NATO	North Atlantic Treaty Organization
NASA	National Aeronautics and Space Administration
NAVSAT	Navigation Satellite
NCOLP	NCO Logistics Program
NICP	National Inventory Control Point
NITEOPS	Night Optics
NOTTS	Night Observation Test and Training Support
O&M	Operations and Maintenance
OA	Obligational Authority
OCRD	Office, Chief of Research and Development
OMB	Office of Management and Budget
OPMS	Officer, Personnel Management System
OPRED	Operational Readiness Office
OSD	Office of the Secretary of Defense
OSDOC	Off-Shore Discharge of Containerships
PCE	Page Communications Engineers
PCO	Procuring and Contracting Officer
PEM	Production Engineering Measures
PEMA	Procurement of Equipment and Missiles, Army
PEQUA	Production Equipment Agency
POL	Petroleum, Oil and Lubricants
PPB-MIS	Planning, Programing and Budgeting and Management
PROMAP-70	Program for the Refinement of the Materiel Acquisition Process
PROMIS	Project Management Information System
QMA	Qualitative Materiel Approach
QMDO	Qualitative Materiel Development Objective
QMR	Qualitative Materiel Requirement
RAC	Research & Analysis Corporation
RD&E	Research, Development and Engineering
RDT&E	Research, Development, Test and Evaluation
RECAP	Review and Command Assessment of Projects
RHF	Return History File
RIA	Rock Island Arsenal
RRAD	Red River Army Depot
RTA	Royal Thailand Army

SATCOM	Satellite Communication
SCC	Standard Commodity Command
SDTS	Second Destination Transportation Services
SEA	Southeast Asia
SIDS	Sonar Infrared Swimmer Detection System
SIMS	Selected Item Management System
SMASH	SEA Multisensor Armament System Hueycobra
SMO	Special Mission Operations; also, Supply Management Operations
SSB	Single-Side Band
STANO	Surveillance, Target Acquisition and Night Observation
STARCOM	Strategic Army Communications
STRATCOM	Strategic Communications Command
SHF	Super High Frequency
SGS	Swiveling Gunner's Station
TAA	Target Acquisition Aid
TACOM	US Army Tank-Automotive Command
TACSAT	Tactical Satellite (communications)
TAGS	Tactical Aircraft Guidance System
TDA	Table of Distribution and Allowance
TEAD	Tooele Army Depot
TEAM-UP	Test, Evaluation, Analysis & Management Uniformity Plan
TECOM	Test and Evaluation Command
TETF	Terminal Equipment Test Facility
TOA	Total Obligation Authority
TOCSA	Test of Containerized Shipments of Ammunition
TOFC	Trailer on Flat Car
TOW	Tube-Launched, optical-sighted, wire-guided (missile)
TOPOCOM	Topographic Command
TPO	Telecommunications Program Objective
TREE	Transient Radiation Effects on Electronics
UHF	Ultra High Frequency
USAF	US Air Force
USAGMPC	US Army General Materiel and Parts Center
USACSA	US Army Communications Systems Agency
USARPAC	United States Army, Pacific
USARV	United States Army, Vietnam
USMC	US Marine Corps
VECP	Value Engineering Change Proposals
WBS	Work Breakdown Structure
WECO	Western Electric Company
WECOM	Weapons Command
WSNR	White Sands Missile Range
YPG	Yuma Proving Ground

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